

The Commercial Car Journal

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NUMBER 2

New Sixes and Gas-Electric Drives Feature A. E. R. A. Bus Exhibit

*Beauty, Comfort and Lighter Weight Indicates Trend of Design—
Nearly 40 Per Cent of Floor Space Occupied
by Bus and Equipment Exhibits*

WITH motor buses, bodies and equipment occupying nearly 40 per cent of the show held last week at Cleveland under the auspices of the American Electric Railway Association, the motor bus industry can feel justly proud of itself. To those visiting the show one of the lasting impressions registered is that motor buses are becoming more beautiful each year. The body manufacturers have done a yeoman job

rangements. The use of air cushions is becoming practically standard practice. Plenty of aisle room is evident while better leg room is being secured by the use of seats that are cut away at the proper angle at the back to give those extra few inches which mean so much in seat comfort and space economy. One seat shown, although not mounted in a bus, indicates the trend in seat design. This particular seat accommodating two passengers, weighs

only 38 pounds complete. The seat frame is an aluminum alloy stamping thus saving about 500 lbs. weight in the average sized bus.

Among the new buses shown for the first time are the six-cylinder White; the Northland Coach, by Wilcox Trux, Inc.; the Liberty Motor Vehicle Co's., gas electric drive equipped with the Fraser electric unit and the Metropolitan Coach, an eight-wheel job, built under L. W. Coppock patents. The Mack six-cylinder job which was described in our last issue made its debut at the show. The American Car & Foundry showed its new gas-electric bus. The Six-Wheel Company besides showing a complete line of six-wheel coaches also announced its new six-wheel truck.

Below: The International Harvester Company's new 15 pass. coach Model SLC

This model may be equipped with four or six cylinders



The new Lang body with baggage space under the seats

in producing combinations of color harmony which are destined to create not only a more favorable impression on the public, but at the same time decrease sales resistance. Briefly the bus manufacturer has recognized the fact that the eye-appealing bus job sells a whole lot easier, no matter what size or price class it is in.

Much effort has been expended by the manufacturers toward securing the utmost in comfort. Considerable thought has been given to better seating ar-



More and more effort is being made to handle the baggage situation on inter-city buses. In some jobs special racks are being placed above the windows as in railroad day coaches. Of course this precludes the possibility of any advertising display. Others are utilizing the backs of the rear row seats by attaching a rack to them. A considerable number of the coaches shown utilize the roof, access to same being had by cleverly arranged folding trends on the side of the body.

A new baggage arrangement which involves the design of the body is that shown by the Lang Body Co., in which the seats are raised slightly on each side of the aisle. The space under the seats provides baggage space. The baggage compartment is lined and to say the least is thoroughly dust and waterproof. Another job shown has special doors at the rear giving access to baggage space located behind and underneath the rear seats.

There seemed to be a slight decrease in the amount of nickel plating used on the jobs shown. Although manufacturers appreciate the fact that an excessive amount of bright parts means more labor to keep them clean, still the owner insists upon it. In other words the public wants to ride in something that looks classy. That the builders of railway equipment have sensed this same situation is proven by the number of beautifully painted trolleys that were displayed.

A number of observation type buses were shown, while some clever arrangements were seen in the methods of handling spare tires. One job showed two tires mounted side by side at the rear. The effect was extremely pleasing as the tires were set in heavy cast aluminum brackets. Highly colored leather effects with wicker seats done in brilliant striping indicated the extent to which color has been employed to please the eye.



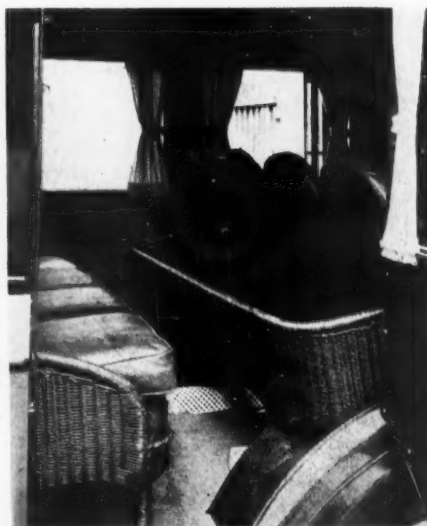
Perflex radiator built specially for the Liberty bus

The shell is bolted to the dash. The core and tank assembly is hinged at the bottom. The core may easily be removed without disturbing the shell at all

White Announces Six-Cylinder Bus

The big feature of the White exhibit was the introduction of a new six cylinder motor bus. This new job has excited considerable interest. Its outstanding mechanical features may be summarized by the following: 100 hp. engine; overhead valves; seven bearing crankshaft; four wheel metal-to-metal air brakes; 9 in. balloon tires; double drop frame and two stage springs. This six cylinder White is designed to provide speed through the country and flexibility in the city with increased performance and with safety control. Increased riding comfort is provided and the low chassis permits easy passenger ingress and egress.

It has a wheelbase of 227 in. and carries from 18 to 23 passengers in a deluxe model with a baggage compartment for interurban service, and 25 to 29 passengers in a pay-enter model without baggage compartment for city service.



Method of carrying small parcels as seen on the Reo sedan type bus



The Aero aluminum seat, showing frame work which is stamped from an aluminum alloy

International Harvester Exhibit

An attractive 15 passenger parlor coach designated as Model SLC, was the feature of the International Harvester Company's exhibit. Two other models were also on display, a 23 passenger parlor coach and a 29 passenger pay-enter city service coach.

The new model which is designed to help round out the comprehensive line of the International Harvester Company, may be equipped with a four cylinder, or a six cylinder engine, as desired. The dominating thought of the International Harvester engineers who designed the SLC coach has been to produce a moderate sized vehicle that has all the characteristics to be expected from a modern coach of any size. Briefly, these attributes are especially designed chassis; smooth, noiseless operation; low center of gravity; minimum height of coach floor from ground; large comfortable wicker chairs; roomy seat spacing; attractive appearance and appointments; unobstructed vision; and attractive and decorative interior.

Special effort has been made to produce a chassis for this coach that will insure long life and continuous operation. The body is of the latest coach type of composite wood and steel construction.

The Air-O-Pure System

The Air-O-Pure Vaporizer exhibited by the Air-O-Pure Co., Hanna Bldg., Cleveland, Ohio, purifies the air by neutralizing foul odors and obnoxious gases. It is operated by the heat generated from any standard electric bulb. The heat liberates into the atmosphere a compound of highly volatile oils and coal tar derivatives.

The bus vaporizer is constructed from aluminum in one piece, especially formed and polished. Vaporization is controlled by a light switch.



Acro Aluminum Seat

This seat developed for bus use, was announced for the first time by Alex. Wolfington's Sons, Inc., 19th & Buttonwood Sts., Philadelphia.

Made of aluminum, these seats weigh only 38 lbs. with cushions and backs. The use of them in the average bus would mean a saving of 500 lbs. per unit. Briefly, the seats incorporate seat comfort, durability, flexibility, and economy of space, together with weight reduction.

Design permits reception of baggage under seat. Seats can also be tilted forward and cushions and backs removed for general interior cleaning. The seats are rubber shock insulated and the bed is of helical spring and flexible steel web construction.

American Brakeblok

The American Brakeblok is a new friction element developed by the American Brake Shoe Foundry Co., 30 Church St., New York, for use on heavy duty automotive vehicles.

The blok embodies a new principle in automotive retardation which is said to assure maximum braking efficiency, durability and minimum maintenance. These bloks can be used on vehicles equipped with foot or power brakes.

The bloks require less than one-third of the area of the drum, have no metallic contents, are not affected by water, oil or grease, and are readily replaceable.

Morrison Bus and Truck Jack

The Morrison Jack Co., Alliance, Ohio, developed and announced for the first time, three models of automatic bus and truck jacks, designed for specific duty.

These three models are known as the Tug, which is electrically operated and designed for heavy duty service; the Speeder, also electrically operated, a lighter design but for general service; and the Placer, which is manually oper-

ated and designed for light service, such as tire changing.

The Tug is equipped with a high speed universal motor, controlled by a reversing switch which automatically reverses its action when it has reached the limit of travel in either direction.



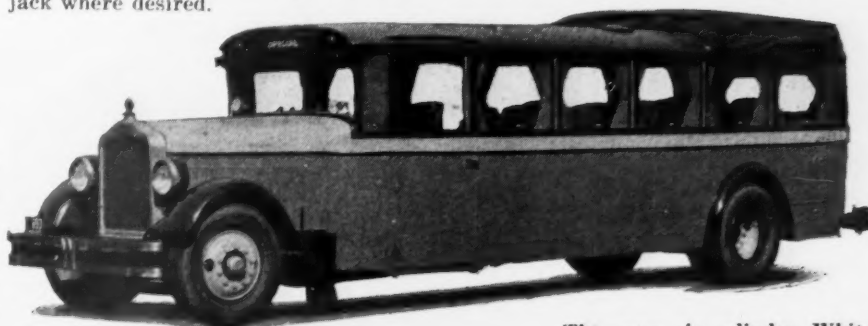
The six-wheel truck made its debut at the A. E. R. A. show

Details of this new model will appear in our next issue

This jack has an 8 in. lift with a graduated range of starting points ranging from 6 to 10 in. This jack is ruggedly constructed and requires less than one minute to raise the heaviest bus or truck full range.

The Speeder consists of a Morrison automatic, double-range, heavy duty jack, geared to a high speed universal motor. The handle can be released and lowered to the floor for convenience of the workman.

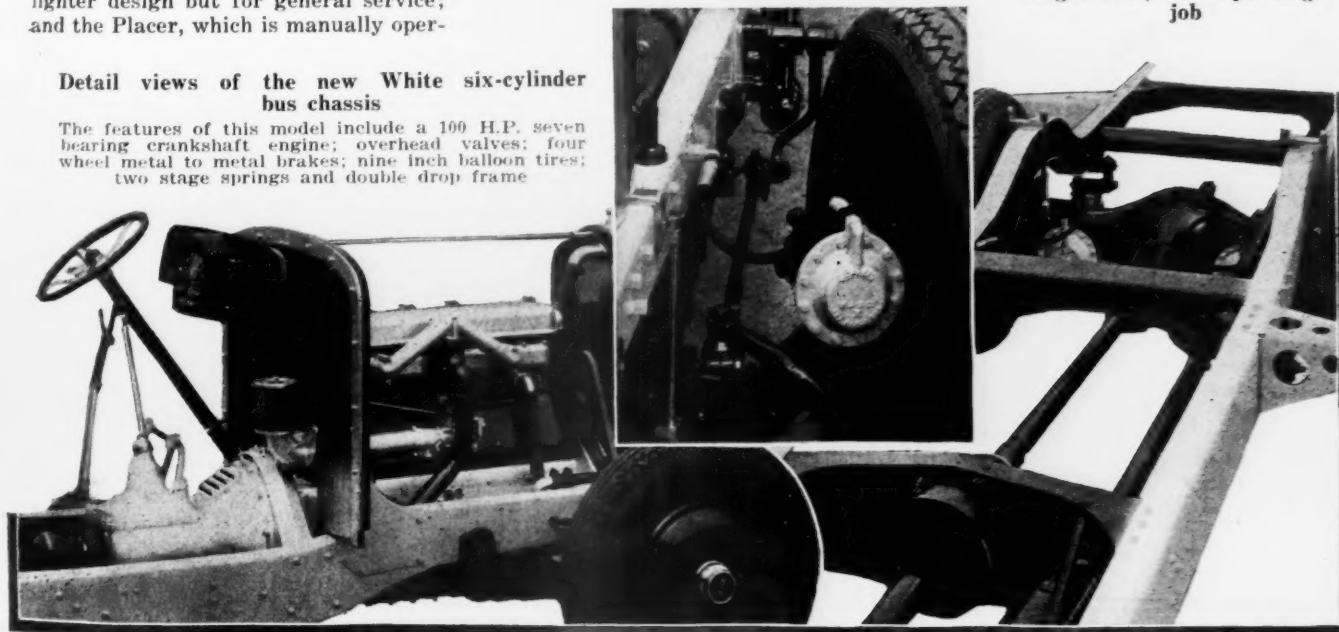
The Placer is a Morrison automatic, double-range jack with a special handle permanently attached by means of a universal joint and a simple locking device which effects a rigid connection between the handle and the jack. It permits a quick and accurate placement of jack where desired.



The new six-cylinder White single deck, 18-29 passenger job

Detail views of the new White six-cylinder bus chassis

The features of this model include a 100 H.P. seven bearing crankshaft engine; overhead valves; four wheel metal to metal brakes; nine inch balloon tires; two stage springs and double drop frame



Metropolitan Eight - Wheeler

The Metropolitan Coach and Cab Corp., Cleveland, Ohio, exhibited for the first time its eight wheel, 32 passenger coach.



The Metropolitan high-wheel coach chassis

A feature of this job is that the "trucks" both front and rear are readily removable, as the chassis is built on the three unit construction principle

A feature of the Metropolitan chassis is its three unit construction, with independent front and rear "trucks." The front and rear axles with rigid sub-frames, form the first two units and the main frame of the coach, carrying the hood, steering gear and transmission, forms the third unit. While the front and rear truck units are of rigid construction, they admit a flexibility of axles to meet varying road conditions. The axles are so mounted in connection

20x7.50 Firestone bus balloons; Ross cam and lever type steering gear; Brown-Lipe clutch and transmission and spiral bevel full floating rear axle; Christensen air brakes.

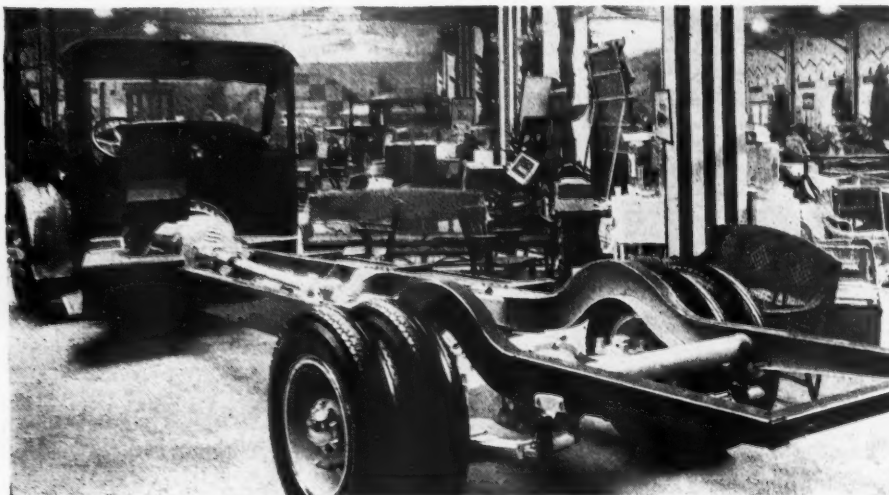
Liberty Gas-Electric Bus

A light weight chassis, clean-cut design and an electric control are features of the gas-electric Liberty bus.

This new bus is built around an electric transmission invented by E. M. Fraser. Among the unusual features is the location of the engine, radiator and control on a sub-frame secured to the main frame. The power units can be slid out on skids in a few minutes when inspections are necessary. The

core of the radiator can be removed by dropping the shell forward and by removing four screws. Removal of the power unit does not involve removal of the wiring, as all electric contacts are automatic. It is only necessary to disconnect the muffler pipe, gas and oil lines, and these are so designed as to make such disconnections simple. Braking is done entirely with the engine and the construction is such that the full power of the engine may be used for this purpose.

(Continued on page 17)



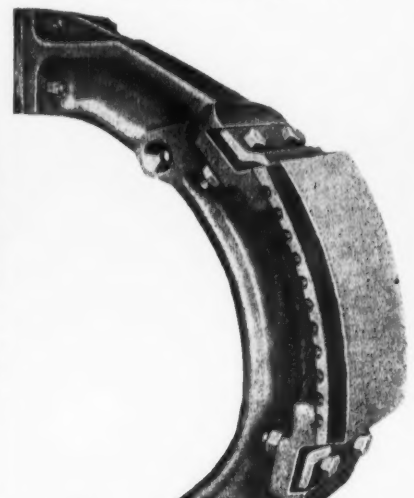
Rear view of the Liberty gas-electric bus

with the sub-frames, that alignment is maintained at all times. The caterpillar action resulting from the "truck" construction, gives a smooth, shockless, vertical action to the main frame as the coach mounts road irregularities.

All four wheels of the forward "trucks" are actuated by the steering gear. The wheels of the rear unit "track" without side slipping.

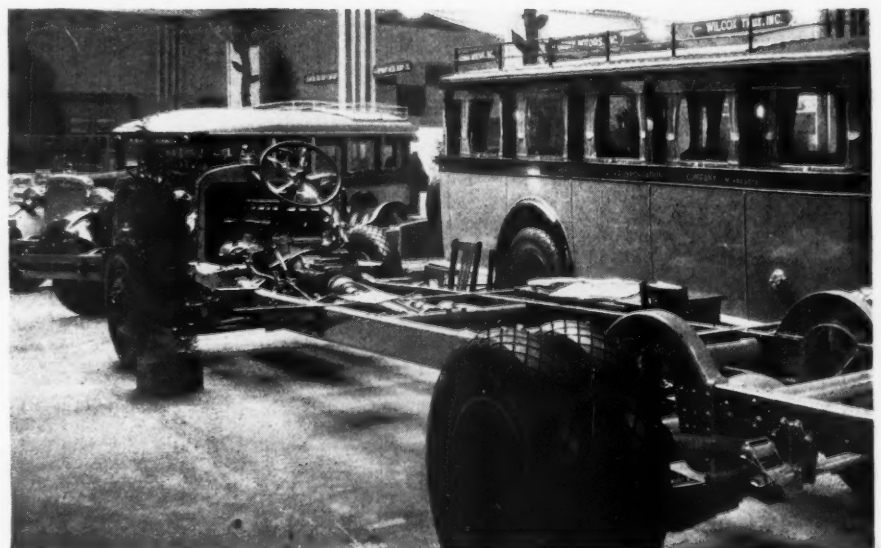
Interchangeability of units, standardized repair methods and servicing equipment are pointed out as being the contributing factors for maximum productive service.

Among the units assembled in this new chassis are: Continental six cylinder, $4\frac{1}{4}$ by $5\frac{1}{4}$ engine, developing 72 hp. at 1500 r.p.m.; Bosch high tension magneto, with impulse coupling; Zenith carburetor and Autopulse dual pump; Northeast generator and self-coupling;



The American "Brakeblok"

(See description page 9)



The Northland coach shown by Wilcox Trux Co.

(Description page 17)

Make Every Call NEWSY!

Make your prospects feel glad to see you no matter how often you call, by injecting timely and newsy ideas into your sales talk.



By Frank H. Williams

THE more calls the commercial car salesman makes, the more sales he makes. That is axiomatic.

However, when in the ordinary course of events, the commercial car salesman calls quite frequently on all his prospects, his calls become rather stale. He may, in fact, simply present the same old arguments in the same old way and hope to beat down sales resistance simply by wearing the prospect out.

Of course, many sales are made in this way but it is found by some live wire, highly successful commercial car salesman that a much better plan than simply wearing down the sales resistance of prospects, is to inject a newsy touch into each call and so make the prospects actually glad to see the salesman no matter how many times the salesman has already called.

Just what is meant by this? And just how can other salesmen cash in on this same proposition?

By making each call newsy it is meant that every time the salesman calls on a prospect he will present some matters concerning the truck he is selling which will appeal to the prospect because of their freshness, newness and importance.

At first thought it might be considered a very difficult proposition to do this. But it isn't as difficult as it seems.

Here, for instance, are some sugges-

tions which salesmen might present to their prospects when making calls:

Names and addresses of individuals and concerns who have purchased trucks from the agency since the salesman's last call on the prospect, together with ways in which the purchasers are using the trucks and together with complimentary things said by the purchasers regarding the trucks.

Names and addresses of owners already having fleets of the trucks who have recently purchased additional trucks from the agency, together with the reasons why the owners have made these purchases, these reasons being given in the owners' own words.

Tell 'Em How It's Done

Information regarding the sales arguments which the salesman is finding most effective in putting sales of the trucks across to other prospects and reasons why these sales arguments are proving so effective. To present the sales arguments to a prospect in this way would be to give a newsy slant to the proposition while, at the same time, the arguments were impressively presented.

Points emphasized by the dealer or his salesmanager in the regular salesman's meetings and things said by the dealer or his salesmanager regarding the best

ways of making sales. This, too, would enable the salesman to get his sales arguments across while he would invest them with a newsy touch which would make them unusually interesting to the average prospect.

Information regarding the things done by the service department of the agency in taking care of owners' trucks. Here there is a particularly fertile field for newsy stuff which will be of real help to the salesman in making more sales. The salesman could discuss the careful way in which the service department of the agency checks up every truck that comes in for service for the purpose of seeing what additional repairs or adjustments may be needed for the purpose of making these repairs or adjustments at the time the truck is in the garage. Also, in connection with this, the salesman could explain how the agency keeps track of the repair costs on the various trucks coming into the service department for the purpose of determining just what maintenance costs on the trucks sold by the agency are per year. This would lead into the subject of costs and comparisons which is always of interest to user prospects. And so on along the same line.

Information regarding the way in which the sales of the agency are increasing. Everyone likes to get inside

(Continued on page 16)



Christopher J. Hayden, who in four years has established a chain of sales and service departments and built up to a gross of three quarters of a million dollars

After the

MILLION

in 1926

That is the aim of Christopher J. Hayden, dealer of Stamford, Conn., four years ago

Successful truck merchandising largely a matter of sincerity and conscientious application of common business policies

By C. P. Shattuck

ON the last day of the year 1922, Christopher J. Hayden, of the Hayden Automobile Company, Stamford, Conn., embarked in the truck business. Contrary to the prediction of contemporary truck dealers, Hayden, twenty months later, opened another place in Norwalk, 9 miles distant, and a year later, still another in Bridgeport.

Despite the pessimistic truck dealers Hayden's volume grew. In four years his methods have resulted in a gross of \$750,000 in 1925. He is shooting at the million mark for 1926. He employs no spectacular stunts or circus advertising. Neither has he any special merchandising plans. Ask him the rea-



Above: Ample storage and repair facilities characterize all Hayden's service stations



Left: The stock or parts rooms of all three service stations are standard and so complete that a new truck could be assembled

sons for his success and he will reply, "Close attention to business, employing sound fundamental business principles and making a business appeal to the thinking type of business men who are prospects for trucks."

Hayden could have made that million mark gross last year if he had not adhered to his rule of business at a reasonable and fair profit. While big gross profits look pretty it is not so attractive as the proper net profit. And it is the proper net profit that gets Mr. Hayden's attention when he scans the statements of his three establishments.

Mark

*J. Hayden, truck
years after start.*



Above: The first Hayden establishment at Stamford, Conn.

Left: The store, machine and repair departments were plotted out with an eye toward expediting all service work



Having been in many branches of the automotive industry, including service, Hayden believed in one of the fundamentals of truck merchandising; the buyer must be afforded prompt service at a reasonable cost. He also believes that the business house using trucks and making deliveries in a radius of 30 miles, for example, should be supplied with service that will avoid long distances of travel.

The territory handled by the company is about 33 miles long and about 30 wide. From Stamford to Norwalk is 9 miles. It is 14 miles from Norwalk to Bridgeport. These places are on the New York-Boston main highway, and between are small places. From the main highway to the border of the county from the Hayden service stations is about 9 miles. Thus it will be seen that the chain of service stations are strategically located. In addition there is a dealer at New Canaan and at Bethel, both within a short distance of Norwalk and Bridgeport.

Hayden refers to his plan as the chain service, it having always been his idea to so cover his territory with service stations that any customer could obtain service within a reasonable distance. A driver of a Bridgeport truck can charge service at Stamford or Norwalk. The service is standardized, the customer paying the same rate for labor and material in any of the service stations. It is said that under given mechanical conditions the cost of an

operation is quite similar in all stations. From this it may be assumed that the production-labor—is about the same.

Large Parts Stock

The parts stock of the three stations inventories about \$20,000, and is most complete, Hayden stating that a complete truck, chassis and body, could be assembled. The parts stock is balanced. The stock of quick moving parts is the same in each station but the slower moving, such as frames, engine blocs, etc., are divided among the three places. This reduces the inventory but does not decrease the efficiency of the service for a service parts truck operates between Stamford, Norwalk and Bridgeport, and any unit or part delivered in a very short time.

Each service department is in charge of a head. Similarly each branch has its own manager. While the three are under one head, they are operated practically as separate establishments. The heads of the departments, including the managers, are those who started at the bottom and worked up. This is a policy of Hayden's. He believes that the interested employee, the type that does not rate his compensation by the clock, is entitled to consideration, so whenever there is an opening the man is picked from the ranks. This, plus the fact that the managers receive a bonus or commission in addition to a salary, provides an incentive.

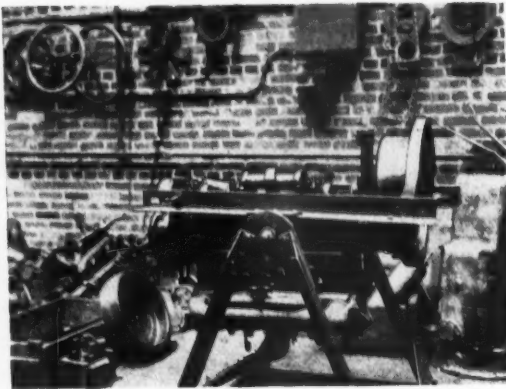
There is competition, of course, between the three establishments, which keeps the heads of the department on their toes. This competition exists not only in the sales force but in the service department. And it is interesting to note that all three are in black ink and there is always plenty of work. As a matter of fact the service department is reaching out for more room for the demands for service and sales are increasing.

There is nothing unusual about the service departments. These are conventional as to equipment, methods, etc., but there is a difference in results, i. e., production. The Hayden Company is not bothered with changes in its mechanical staff. New England breeds good mechanics and, if paid right, and treated right, they will produce.

Hayden says that changes are rarely made. If a new mechanic is put on he must be good for it does not take the "gang" long to discover the would-be mechanic. The men, and all employees for that matter, are given the usual vacation with pay, paid when out with illness, for holidays or when away. Mechanics are not laid off in the winter. They get their salary if they do not spin a wrench, but, there is always plenty of work which tends to prove that it is possible for a truck dealer to render service that satisfies.

That word courtesy, so often mentioned but less practiced, will be found at any of the Hayden establishments. No matter who the caller, at the office, salesroom or service station, he is treated courteously. Hayden practices

(Continued on page 39)

EQUIPMENT REDUCES:
(a) Cost (b) Time (c) Delay

Engine stands are essential for overhauling heavy duty engines. Size and weight render make-shift supporting methods costly from the standpoints of time and labor

AN engine overhaul is a first class test of shop efficiency. Skill, equipment and knowledge are required. Without them engine reconditioning cannot be performed on an economical basis.

Lack of skill brings about immediate failure of improperly fitted and repaired parts, or at best, a short interval until another overhaul is required.

High cost, delay and poor workmanship are found where up-to-date equipment is not available. Lack of knowledge causes all the troubles mentioned, and more.

For an example of lack of skill note the bearing shown in the illustration labeled "Cause" on the next page. The babbitt has been gouged and hacked rather than scraped. The dark sections are several thousandths of an inch lower than the light areas. Consider also how such a carelessly fitted bearing endangers all of the bearings in a pressure-lubricated engine because it allows oil to squirt out, robbing the other bearings.

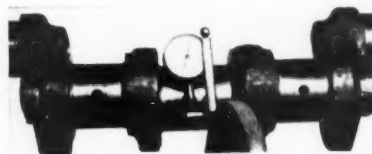
It requires about three days for a mechanic to properly hand-scrape a set of main bearings. If undersize bearings are being used with a re-ground crankshaft more time may be needed.

With special main and camshaft bearing machinery fitting of mains and camshaft bearings can be completed in one day. The connecting rods can also be fitted during the same time by another mechanic using a connecting rod tool. This indicates the higher cost and loss of time which result from lack of equipment.

The importance of knowledge on the part of a mechanic may be illustrated in many ways. The difference in fitting a connecting rod in a pressure lubricated engine rather than a splash lubricated one and the consequences of putting a connecting rod with offset piston in backwards are two of the more obvious.

SKILL PERMITS:

- (a) Precision
- (b) Speed
- (c) Short Cuts



In the hands of a skilled mechanic a dial indicator gives a true version of crankshaft condition, revealing out-of-roundness or out-of-true in thousandths

Removal of the engine from the frame, reconditioning of crankshaft and main bearings and the camshaft and its bearings and drive distinguish major engine overhauls from top overhauls and similar operations. See "What Constitutes a Top Overhaul," page 10, August issue Commercial Car Journal.

Steps of the Work

A portable work bench, preferably with a vise, boxes or bins for holding groups of small parts separately and an overhead hoist are essential for removing the engine. A little planning in advance and familiarity with the vehicle under repair will save much time in removing the engine from the frame. Such a thing as taking the exhaust pipe off before or after the gasoline pipe may make a considerable difference in time. Therefore, the sequence of operations in removing various controls should be studied.

Engine support bolts are often troublesome to remove and the special wrenches required in each case must be ready if loss of time is to be avoided. Balancing the engine as it is hoisted from the frame is another time saving

Three Essentials Overhaul Skill... Equipment

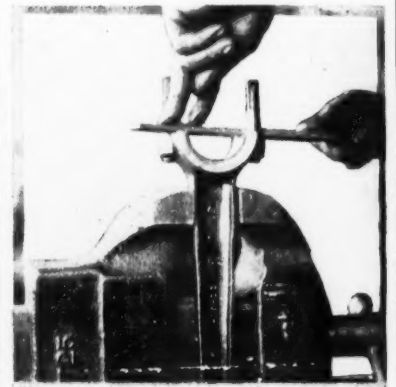
Without these engine reconditioning cannot be performed on an economical basis.

By

James W. Cottrell

KNOWLEDGE PREVENTS:

- (a) Errors
- (b) Omissions
- (c) Duplication



Bearing caps may require filing to fit connecting rod. Bearing edges should extend above rod surface to insure positive seating of bearing shell

scheme. The use of special eye-bolts which screw in the spark plug holes, or brackets which are bolted to the engine studs and two lengths of chain attached to a large hook or circle will enable the mechanic to balance the engine in the hoist easily and surely.

Cleaning of the engine assembly is one of the most unpleasant tasks connected with an engine overhaul, when hand methods are used. A preliminary cleaning with steam is used in some shops before the engine is removed from the frame. In others, the engine, suspended by the hoist, is moved on an overhead track and lowered into a cleaning tank in which patented cleaning materials or kerosene are employed.

entials of Engine haul

ment... Knowledge

From the cleaning tanks the engine is moved to an engine stand and bolted in place.

Disassembly and Inspection

Thorough inspection and accurate measurements of all wearing parts is in order during the disassembly. The oil pan is removed, cylinder head is taken off and connecting rod assemblies taken out. The camshaft and crankshaft are lifted out.

Measurement of the crankshaft at this point determines the extent to which work on the main bearings is to be carried out. The shaft is mounted on a bench in two V blocks and the bearing surfaces tested with a dial gage. Out of roundness may be measured with a "mike" and it is customary to measure each of the bearing surfaces in this way. However, a "mike" will not show whether the shaft is running out of true and the dial gage is used on each of the main bearing surfaces to determine this point.

If the crankshaft needs regrinding the work on the main bearings is sometimes held up until the crankshaft has been reground. The condition of the cylinder bores is measured with inside micrometers, a special form of dial gage, or by measuring clearance between cylinder wall and a standard piston with ribbon shims.

Limits of Variation

A taper of more than .005 calls for reconditioning of cylinder bores. The limit of out-of-roundness is less. Many shops will not pass a cylinder which is more than .003 out of round. Wear shows in both taper and out-of-roundness and need for refinishing cylinders can be determined by either measurement.

Limit of out-of-roundness for crankshafts varies slightly according to the diameter of the shaft bearing surfaces. Three thousandths is the limit for eccentricity of crankshaft journals, measured through the center of the bearing surface. Some shopmen like to keep within .0025, while others allow .0035 or .004 before regrinding. The last figure is high.

Camshaft size limits are held closer than similar dimensions of crankshafts. Two thousandths is the limit of variation in bearing size and eccentricity.

Despite the larger size and slower speeds which characterize heavy duty engines balancing is not less important in overhauling them than is the case with passenger car engines. A limit in balancing weight of 1 oz. of connecting rod assemblies for large engines is standard in many service shops. Piston weight tolerance of 1/4 oz. is attained in regular production and a greater variation should not be allowed in repair work.

Boring, reaming, honing and grinding are used to recondition cylinder bores. Regrinding with a final finishing operation with a hone is used in many shops with success.

Reconditioning of the cylinder walls will be required in practically all major overhauls. New pistons, rings, piston pins and bushings are installed in all cases.

When the reground crankshaft is returned to the engine assembly stand,

Picturization of Cause, Effect and Remedy, in Their Relationship to Service

CAUSE. Above, right: A bearing that was gouged and hacked instead of scraped. Note the small areas of high spots and extra anchor screw holes



EFFECT. Above: Tied up. Thirty miles from home. "Burned-out" bearing. Improper bearing fitting was responsible

REMEDY. Left: Use a connecting rod boring machine. It insures accurate fit of bearing to shaft at a marked saving of time over hand methods

the next step is fitting the main bearings. Undersized main bearings are used and these are reamed to accurately fit the new size of the shaft. The fit of the main bearing shell in the crankcase and main bearing cap is especially important and the mechanic must be sure that the bearing shell is seated firmly before proceeding with the reaming operation.

Main Bearing Reaming

Many types of main bearing reamers and boring bars are available for reaming the main bearings. Space will not permit a detailed description of main bearing work with these tools. This subject will be dealt with in a special article in a coming issue.

Hand scraping of the connecting rod bearings is very wasteful of time, especially if an undersized shaft is being used. With the size of the shaft known it is a simple matter to bore out the connecting rod big end on a machine so that hand scraping is unnecessary. A clearance of .0015 to .002 in. is usually allowed on connecting rod bearings.

After boring the connecting rod big end and fitting the piston pin to the upper end, the rods are always checked for twist and bend. Aligning tools of various kinds may be employed. If these are not available, a bevel protractor can be used. All the benefit of fitting new bearings is more than offset by a bent or twisted rod.

Fitting of new timing gears or tim-

ing chains and sprockets is included in the major overhaul. The work can be done easily at this time and it is not wise to take chances on camshaft drives that have almost but not quite reached the end of their useful life.

Valve lifter assembly and valve guides should also be reconditioned during the major overhaul. It is impossible to get an accurate adjustment of valve stem clearance with a worn valve lifter or valve lifter guide and a badly worn valve guide will bring about need for regrinding valves at short intervals.

True Running Flywheel

A check which should be made during the major overhaul is the true running of the flywheel. The crankshaft which has been assembled in the main bearings and the flywheel bolted in place should be turned over by hand and a check made with a dial gage or other accurate measuring device to make sure that the flywheel runs true.

It will be noted that a large part of the accurate work on major overhauls is done by machine tools and that the work at the engine stand is largely that of disassembly and reassembling parts. This fact does not, however, do away with the need for skill and accuracy in workmanship on the part of mechanics doing the assembly. A little touch with the bearing scraper to relieve the edge of a bearing, careful check of the fit of every part put in place, oiling of each bearing surface as it is assembled are but a few of the many points a mechanic on this part of the work can contribute to a satisfactorily completed job.

Gaskets, bolts, nuts, lock washers, cotter pins and other small parts should be at hand during the assembly period. A great deal of time can be lost by mechanics chasing back and forth from the stock room to get these seemingly unimportant parts.

When completed the engine is taken to a test stand and run in by power to limber it up. With the completion of assembly a coat of paint on the exterior of the engine will add greatly to its appearance and increase the likeli-

hood that the driver will keep it cleaned after installation in the vehicle.

Minor Units

An overhaul of all of the minor units is performed during the work on the engine. Fan bracket and bearings, carburetor, vacuum tank, ignition unit, spark and throttle control, wiring, switches, and clutch are checked and repaired during this time. With the engine in place the various units are attached and the job is ready for test.

Of course it is possible to work an engine out of the frame with a rope sling and a lot of muscular force. It can be disassembled on the floor and the parts scattered about. The crankcase can be turned upside down on the floor and the main bearings scraped by hand with the hope rather than the assurance that the crankshaft is in good condition, connecting rods may be replaced with the same fond hope that they are all right, but such methods take a lot of time, cost a lot of money, and result in poor jobs.

The test of an engine overhaul is the length of time the engine will run before another major overhaul is required. The ideal is that the overhauled engine shall run just as long as it did before the first overhaul was required. If an engine runs 25,000 miles before an overhaul is required, and only runs 12,000 miles before a second one is necessary, it is evident that the overhaul has not put the engine in the best possible condition.

The operating life of an overhauled unit is the real test of shop efficiency.

Make Every Sale Newsy

(Continued from page 11)

information concerning business in which they are interested. Consequently it would be very interesting news to the average truck prospect to learn that the truck he is considering is growing popular in the territory.

Information regarding the manner in which the agency is striving to help its owners to get greater profits out of

the trucks they operate, represents another angle. In this connection salesman could explain the delivery systems worked out by himself or the agency for establishments in the territory for greater economy, showing how to cover routes with less mileage and trouble. The salesman could tell, too, how contracts and business is secured by the agency for some of the owners of trucks bought from the agency. And how the agency passes on to owners, by means of mimeographed bulletins, information that it secures about ways and means of cutting down the expense of operating trucks.

Information regarding objections raised by some of the salesman's prospects when urged to buy trucks and further information as to the way in which the salesman overcame these objections. This would be new and newsy in many cases because so many salesmen like to convey the impression to prospects that no other prospect has ever before raised serious objections to purchasing a truck. So prospects are naturally curious as to the objections raised by other prospects and how they were overcome. They become attentive. All of which helps greatly in putting sales across.

Information regarding the many different ways in which the owners of trucks in the territory, employ their trucks is interesting. A complete list of the different uses to which truck owners in the territory are putting their trucks for presentation to a prospect, together with some explanatory words about the whole proposition, is not only interesting but would help greatly in making a prospect realize that the truck he was being urged to purchase was just the right thing for his business.

The presentation of news as the foremost feature of each repeat call on a prospect would, inevitably, make the salesman's talk snappier, more interesting and more vital. And this, of course, makes an exceedingly good impression on the prospect and in turn makes it just that much easier to sell the prospect.

Get more news into YOUR calls, Mr. Salesman. You'll find it is mighty good business to do so.



Designed exclusively for the merchandising of trucks

This new home for displaying, storing, selling and servicing motor trucks was recently completed for the Birmingham branch of the Federal Motor Truck Co. It is equipped to handle business for the entire state of Alabama. The service shop at the back has been equipped with modern shop and tool equipment which will materially reduce service operations.

Liberty Gas-Electric Bus

(Continued from page 10)

Buttons for the control of the bus are located on a control box directly beneath the spider of the steering wheel. The control box also serves as the instrument board.

The vehicle shown has a 232 in. wheel base and its Motor Wheel Company's spoked wheels, carry 38 by 8.25 balloon tires. The engine is a six cylinder Waukesha; radiator, Racine; axle, Eaton. Chassis lubrication is provided by Bowen "one-shot" system. The frame is of S.A.E. 2330 alloy steel, heat treated.

Wilcox Trux, Inc., Northland Coach

The Wilcox Trux Co., Inc., Minneapolis, Min., exhibited a 241-in. wheel-base chassis built to specifications of the Northland Transportation Co., the bus operating subsidiary of the Great Northern Railway, which renders bus service over 3000 miles of highway in Minnesota.

Power is supplied by a Waukesha 6-A $4\frac{1}{2} \times 5\frac{3}{4}$ in. engine and is transmitted through a Brown-Lipe clutch and transmission, a double universal shaft, equipped with a large self-aligning ball-bearing center bearing to a worm drive, inverted type, full-floating, rear axle. The cooling system includes a gear-driven centrifugal pump, and an assembled type radiator with cast aluminum side supporting members. The frame is double drop type, to permit low center of gravity, with cross members of seamless steel tubing. Springs are semi-elliptic front and rear. Steering is through a cam and lever type gear. Service and emergency brakes are on rear wheels and B-K booster brakes

are standard equipment. Either Westinghouse or Christensen air brakes are supplied as special equipment. The disk steel wheels are equipped with 38 by 7 high pressure, or 40 by 9 balloon tires.

Spicer Bus and Truck Universal

The type "O" oil lubricated, bus and truck size universal joints, were exhibited by the Spicer Associated Companies for the first time at the show. The oil of these joints is held in by a one-piece ring which also keeps the parts of the joints in permanent alignment. These joints are said to be capable of running for several thousand miles without oil renewal.

Heywood-Wakefield Company exhibited a complete line of bus seats as well as a new seat for drivers. This seat is mounted on an adjustable pedestal providing four different heights, plus a forward and back adjustment of three inches.

Northeast Electric Exhibit

Of particular interest among the exhibits of the Northeast Electric Co., were the Mono-control windshield cleaner and the new ball bearing ignition units.

The Mono-control windshield cleaner is of the one-piece swinging type, but instead of being hinged at the top is hung on trunnions at the end of the top cross member, which engage in bronze bushings set in to the corner posts. It is operated by a crank which can be located at any point along the top cross member. Compensating spring adjustments are provided to overcome sideplay and end thrust.

The new ball bearing ignition unit is furnished with either manual, semi-automatic or full automatic spark advance, and for either left or right mounting. It has been developed particularly for heavy-duty bus service and is available with spark advance in conformity with the characteristics of the engine to which it is applied.

Three-Way Dump Body

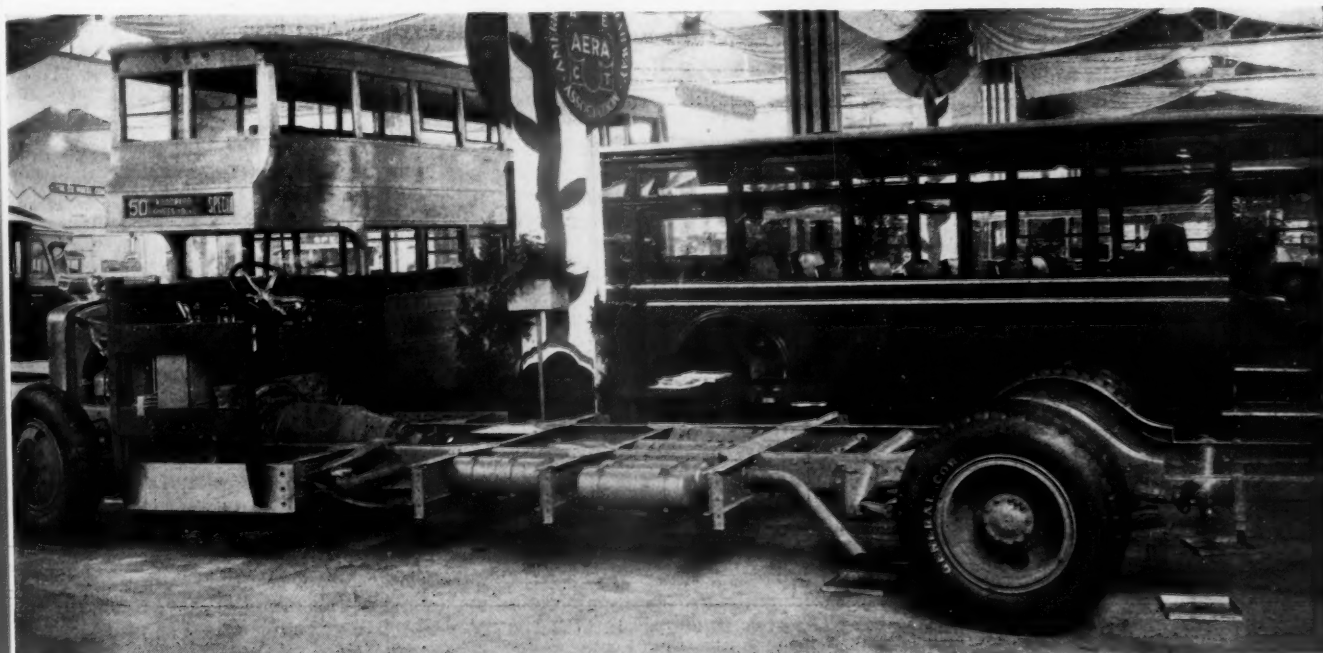
The Differential Steel Car Co., Findlay, Ohio, introduced its new three-way dumping body. This body is arranged to dump at either side or at the rear.

The body itself is constructed entirely of steel. The floor plate is flanged and the sides form deep and rigid girders. The body is electric welded throughout. The body is raised and dumped in any of the three positions with a minimum of time and effort, one lever and three notches hinges the body and two movements of the screw hoist, up and down, performs the duty.

The hoist mechanism consists of a telescoping screw driven from a power take-off. A ball and socket joint permits the screw to tilt in any direction from the perpendicular.

Aluminum Plymetl

In step with the trend for reducing body weight, the Haskelite Corp., developed a new material for reducing weight of side panels. This material is known as aluminum Plymetl. The new material is $\frac{1}{2}$ in. thick, weighs about $1\frac{1}{2}$ lb. per sq. ft., while the ordinary Plymetl, with a steel coat, weighs 2 lb. Aluminum Plymetl consists of three ply Haskelite ply wood, to which is cemented 26 gage sheet alloy aluminum.



The American Car & Foundry Co., featured its new gas-electric bus chassis

Pontiac Enters the Commercial Field With a Light Six

GENERAL MOTORS entry into the light six-cylinder commercial field with the new Pontiac Six delivery car listing at \$770, marks the introduction of the lowest priced six-cylinder commercial car on the market. Among the special features of this new unit are the driver compartment which resembles the front interior of a sedan, integral body construction, Duco finish and pleasing passenger car lines.

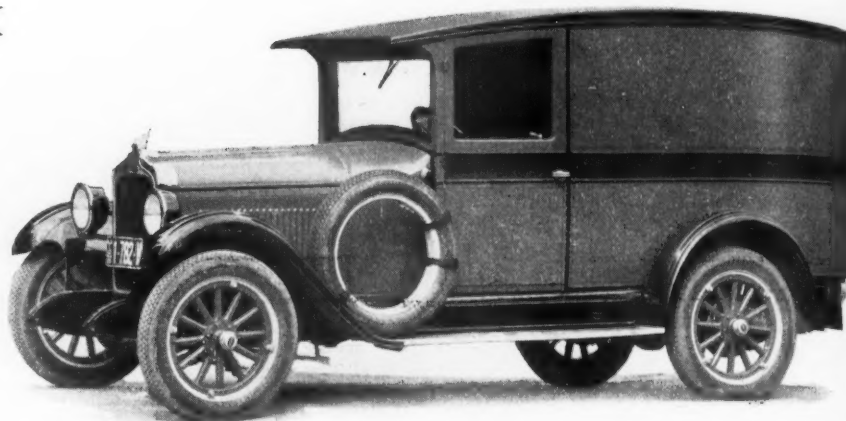
Manufactured by the Oakland Motor Car Co. and distributed through their dealer organization, shipments are being made now to the larger Oakland-Pontiac dealers in various parts of the country. The delivery car chassis is the regular Pontiac Six unit introduced nine months ago except for thicker leaf rear springs and heavy-duty commercial balloon tires of the regular nominal size, namely 29 by 4.75 in. The rated pay load is 1000 lb. with the total body and chassis weight 2470 lb.

With the view that drivers operate a commercial vehicle with greater care, higher scheduled speed and lower operating maintenance costs if proper attention is paid to the driver's comfort, the front compartment of the new delivery car is almost identical to that of the Pontiac two-door sedan.

The panel body formed integral with the driver's compartment is of the fully enclosed type with two loading doors at the rear. Construction is of the composite type employing one-piece side panels formed of wood and metal veneer cemented together, the metal being on the outside. Due to the use of steel braces, mortised joints and the special side panels the body is unusually soundproof and free from vibration.



Many parts used in the driver's compartment of the delivery car are the same as those utilized in the Pontiac two-door sedan



The Pontiac delivery car listing at \$770, is the lowest priced six-cylinder model of its type on the market. It has a rated pay-load of 1,000 lb. Except for heavier springs and heavier tires, the chassis is identical to that used for the Pontiac cars

The roof of slatted construction curving down over the windshield to form a sun visor, is covered with DuPont rubberized material. Drip moulding extends entirely around the roof while steel strips running lengthwise protect the hardwood flooring.

Interior dimensions of the load compartment are, length 69 in., height 46 in. and width 43 in. With normal load the height of the body floor is 25½ in. from the ground while the capacity of the interior is 77 cu. ft.

Except for being upholstered in Fabrikoid, the two folding seats are identical to those utilized in the Pontiac two-door sedan. The windshield, a Fisher "VV" one-piece unit mounting an automatic cleaner, is employed also, while the doors with conventional high speed window regulators, catches and hardware are similar to those of the sedan.

The engine mounted in the frame at three points is of Pontiac make and of the conventional "L" head type with the water circulation by pump. Having moderate speed characteristics, the bore and stroke dimensions are 3¼ by 3 3/8 in. which provides a piston displacement of 186.5 cu. in. and a N.A.C.C. rated hp. at 25.3. The cylinder block is cast integral with the cylinders while the detachable cylinder head is formed in two pieces for ease of maintenance.

Lubrication is of the full pressure type by a gear pump located in the crankcase and driven by the same vertical shaft which operates the ignition distributor.

Fuel is delivered to the Carter 1 in. carburetor by a Stewart vacuum tank on the dash which in turn draws from the 12 gal. tank at the rear. All three electrical units are of Remy manufacture, the starter engaging with the fly-wheel by the Bendix drive.

The ignition distributor is mounted on top of the cylinder block. Current

is supplied by six-volt 80 amp. hrs. battery.

Drive to the rear axle is through a single dry disk clutch of 9 in. diameter and a three speed conventional transmission formed in unit with the engine. Both the pinion and main shaft are carried on New Departure ball bearings with the secondary shaft supported on bronze bushings. The rear axle embodies a taper tubular torque tube while a single universal is employed at the rear end of the propeller shaft. Of General Motors manufacture the axle is of the semi-floating type with a one-piece banjo housing. Drive is spiral bevel type providing a standard ratio of 4.18 to 1.

The front axle is of the usual "I" beam type with the springs mounted above the axle and employing also New Departure wheel bearings. Artillery wheels are standard equipment. Service brake operates externally on 11 by 2 in. drums on the rear wheels with the hand brake effective internally on the same drums. Steering gear is of the semi-reversible type mounting a 16 in. steering wheel. Springs are semi-elliptics all round, those on the front being 36 by 1¼ in. while those on the rear are 54 by 1¼ in., the latter are formed of chrome vanadium steel.

The wheelbase is standard at 110 in. and the turning radius 19 ft. 4 in.

Silent Hoist Changes Name and Headquarters

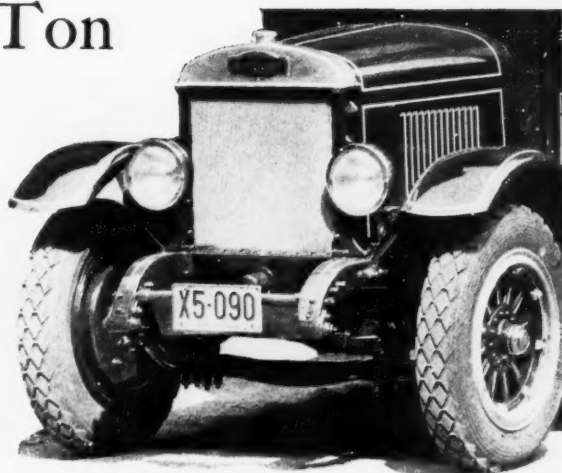
The Silent Hoist Winch & Crane Company recently moved to new headquarters, 762-772 Henry Street, Brooklyn. The new building is considerably larger than the former. The name of the company, which was Silent Hoist Company, was changed at the same time. The object being to more clearly convey the nature of its products.

Autocar Announces 1½-Ton Delivery Truck

REFERENCE was made in our last issue to the fact that the Autocar Company, of Ardmore, Pa., was developing a new delivery truck of 1½-ton capacity. Complete details of this new model Autocar, which are now available, indicate that it is the result of a carefully worked out plan of engineering and combines beauty, speed and stamina in an unusual degree.

Work on this new model has been under way at the Autocar plant for a long time. The Engineering Department not only secured the advice and comment of the Autocar sales organization as to what was desirable to meet modern market demands, but also the engineers worked in close cooperation with the service managers of the important Autocar Branches in order to incorporate in this new delivery truck

of their Delivery Truck cannot be fully revealed at this time because the public is not yet aware that speed and complete control can be as effectively combined in a commercial vehicle as in an automobile. In this connection, it is going to be important for the Autocar Company to emphasize in its advertising and verbal selling that their Delivery Truck is equipped with four-wheel brakes. The extra-safety factor which four-wheel brakes have developed in the automobile field has won general acceptance and support on the part of the public. The introduction of four-wheel brakes to the com-



Close-up of front

Note mounting of the electric head lamps.

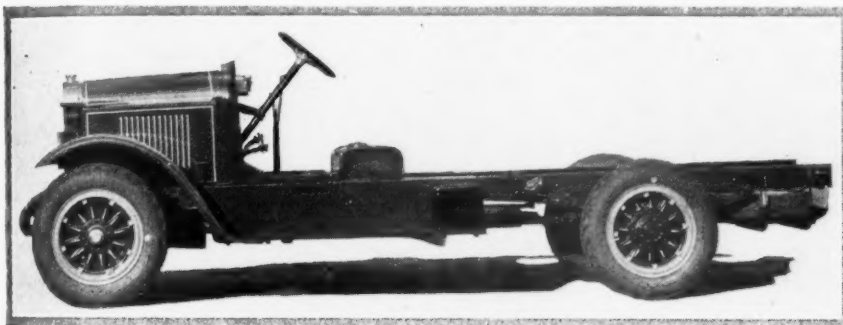
ing Department was instructed to develop this model, it was emphatically stated by the Autocar factory officials that no effort should be spared to produce the best 1½-ton delivery vehicle that could be built, and that it was not to be built to a price. This model incorporates some well-known makes of specialized units, in addition to those units built exclusively by The Autocar Company.

The engine is of Autocar design of 4-cylinder type, 4-inch bore and 5½ inch stroke. The pistons and connecting rods are of Lynite, while the crankshaft is mounted on annular ball bearings. Carburetor is a Stromberg, with automatic float feed. The radiator is of cellular type.

The axles front and rear are of Timken design. The rear axle is a spiral bevel, full floating Timken, having a 5% to 1 reduction. All four wheels are fitted with internal expanding brakes of Bendix design. The hand lever operates the rear wheel brakes.

The ignition starting and lighting systems are by Leece-Neville. The elec-

(Continued on page 20)



Side view of the type A Autocar chassis

those elements of design and construction which would be most helpful in practical operation and economical maintenance over a long period of years.

This Model "A" Autocar Delivery Truck has been put through a long and severe series of road tests, running always with a full 1½-ton load, under every conceivable kind of traffic and road condition. The Autocar engineers have subjected it to every kind of abuse that it might be likely to receive from the hands of an irresponsible driver. The detailed records of these tests, assembled in the Autocar engineering department, reveal figures of speed and endurance which would seem exaggerated in print. For example, a nationally known automobile recently advertised that one of their stock models had made a round trip from Philadelphia to Pittsburgh in 23 hours and nine minutes. Records in the Autocar engineering department indicate that their Model "A" Delivery Truck, running with a full 1½-ton load, made the same round trip in 20 hours and 43 minutes, leaving the Autocar Factory at 12.06 A. M. and reaching the Autocar Factory again from Pittsburgh at 8.49 P. M.

Members of the Autocar organization say that the actual speed possibilities

commercial car field by The Autocar Company is expected to win immediate recognition as a desirable step toward greater safety and control.

This Model "A" Autocar Delivery Truck is, therefore, the result of a carefully executed plan. When the Engineer-



The new Autocar type A, 1½ ton delivery

This illustration shows the clean cut design and attractive appearance of this new model.

Details of the New Mack Six-cylinder Bus

IN these columns last month we briefly described the new Mack six-cylinder bus chassis which was shown at the A. E. R. A. show. Details of this chassis are now available and indicate that this new chassis is being offered in parlor car and city type models, both seating 29 passengers, and the latter may be had with gas-electric drive.

The wheelbase is 232 in. with an overall length of 333 in. for the city type and 341 for the parlor car. At the driver's seat, the frame height is 25 in. Chassis weight complete is 8950 lbs.

Power is supplied by a six-cylinder, L-head engine with $4\frac{1}{4}$ in. bore and 5 in. stroke developing 97 hp. at 2200 r.p.m. The cylinders are cast in block but the heads are in pairs. Four main bearings, having a total length of $10\frac{1}{2}$ in. and a diameter of $3\frac{1}{2}$ in., support the crankshaft which has case-hardened journals. Tubular steel connecting rods are employed while the pistons are aluminum alloys with split skirts and inserts of a material having a low expansion to give constant clearance. Valves are actuated through roller tappets from the four bearing camshaft which is driven by case-hardened, helical timing gears. Only three gears are involved in the front end drive, the third being a bronze gear set transversely to the driving shaft whose opposite ends connect the water pump and Robert Bosch magneto. Force feed and splash lubrication is employed and an oil filter is furnished. The carburetor is a $1\frac{1}{4}$ in. Stromberg to which fuel is fed by an Autopulse pump from the 50-gal. tank mounted on the left side of the frame and shock insulated. Electrical equipment includes generator and starter of the North East make, the former being of 600-watt capacity, and 12-volt, 120 amp. hr. Exide battery. At the rear the engine is supported in rubber insulators by a drop-forged

steel beam through bolted to the rear main bearing thus relieving the aluminum crankcase of twisting strains. Tests are said to show a gasoline mileage of seven and an oil consumption of 320 miles to the gallon.

Drive to the single plate clutch and amidships transmission is through a short shaft having a flexible coupling embodying rubber members to provide cushioning. Ball bearings are used throughout the four-speed transmission. Power is carried to the double reduction rear axle through a two-piece shaft with four universals.

The B. K. vacuum booster is used to

actuate the foot brakes which operate externally on 18 x 5 in. drums on the rear wheels. The hand lever controls an external brake supported from a frame cross member and located between the two pieces of the propeller shaft. The 11 x 6 in. drum is balanced and runs on ball bearings.

Front springs are 46 x $3\frac{1}{2}$; rear, 70 x $3\frac{1}{2}$ in. The steering gear is a worm and wheel type provides a reduction of 20 to 1. Its column is secured to the cowl by a rubber insulated bracket while the driver is further protected from vibration by the use of a 20 in. steering wheel with flexible rim of vulcanized rubber fabric. Spark, throttle and horn controls are mounted above the steering wheel. Fenders are full-crown and the wheels are Budd-Michelin, ten stud disk type. Tires are 34 x 7 in. pneumatics with duals on the rear.

Durant Announces New One-Ton Truck

PRODUCTION has been started on the new six-cylinder, one-ton model called the "Compound Fleettruck," recently announced by the Durant Motor Co. of N. J. The job is priced at \$975 for the chassis and is featured by an entirely new design of four-speed transmission incorporating internal gearing.

No details of the new transmission are available at this time. Its advantages are that greater power at low speeds and higher speeds in fourth gear with less engine speed. The shift from third to fourth or vice-versa can be made at any car speed with the utmost ease, and it is claimed that there is practically no possibility of missing the shift, and the change is noiseless.

The transmission has a standard shift, fourth speed being obtained by pressing down the shift lever. Tests have shown that the use of the fourth speed saves more than 20 per cent in gasoline.

The "Fleettruck" chassis, which is powered with the same engine used in

the Star Six passenger car, will take any standard one-ton truck body. Fuel is carried in an 11 gal. tank under the driver's seat and is fed to the Tillotson carburetor by vacuum. The truck is mounted on 30 x 5 in. high pressure cords and its wheelbase is 128 in. Semi-elliptic springs are used throughout.

The rear axle is semi-floating, banjo type with spiral bevel gears providing a reduction of 5.1 to 1. Service and emergency brakes act externally and internally respectively on 14% in. drums on the rear wheels, the width in each case being $2\frac{1}{2}$ in. The chassis weight is 2350 lb. with a body allowance of 950 lb.

Autocar Announces 1½-Ton Delivery Truck

(Continued from page 19)

tric equipment includes headlights, tail light and horn. Attention is called to the mounting of the headlights. These are set in the radiator shell.

The transmission is a 3 speed Brown-Lipe connected to the rear axle through a three joint shaft, Spicer equipped.

The frame is $5\frac{3}{4}$ inches deep, $3/16$ in. thick pressed steel channel, alloy steel.

Springs are semi-elliptic, front and rear, 40 in. front, 54 rear.

Gasoline capacity is 17 gallon tank under driver's seat. Tires are 32 by 6 in. pneumatic. In the 136-inch wheelbase this Delivery Truck will take the same bodies as many other delivery cars and will take the standard production of commercial body builders. In this wheelbase it has an over-all length of 209 in.; length of frame back of seat 108 in.; length back of seat to center of rear axle $56\frac{5}{8}$ in. The spring shackles, etc., are lubricated by the Zerk system.



The "Compound Fleettruck"—a six-cylinder job

Snap-On Wrenches Promote Better All-'Round Efficiency in Shops

MECHANICS in GMC factory branch service stations have been supplied with Snap-On Mechanikits. Each outfit consists of a set of Snap-on socket wrenches, handles and a steel tool box. The assortment of sockets and handles was carefully chosen to provide a socket wrench for each bolt, nut or cap screw on the various models of GMC trucks. Only those sizes needed for GMC trucks are included and every one required is provided.

Space is available in the Mechanikits for the mechanic's own tools. The kits and socket wrenches are issued to the mechanic on memo and each mechanic is responsible for the contents of the set. In case he leaves the employ of the GMC branch the tool outfit is carefully checked before being taken into the stock room for re-issue.

Better all-round shop efficiency where each mechanic has a full set of socket wrenches adapted to the units being serviced was one of the factors which led to the adoption of the Mechanikit for use in GMC branches.

Sales have been made in many cases according to the Motor Tool Specialty Co., by making a time study in a shop and showing the proprietor the amount of time lost when one mechanic borrows a wrench from another. The mechanic who has a wrench for the particular operation in his kit loses time due to the interruption by the mechanic who asks for the use of a wrench "for a minute." And the borrowing mechanic loses time while he asks for the wrench and waits until the lending mechanic takes it from his tool kit or finishes using it.

Time sales of wrench kits, financed by shop owners, have been worked out in many instances to insure that all mechanics had uniform wrench equipment. Where it is found that most mechanics in a shop have wrench sets and the few without are unable or unwilling to pay out the cost of a wrench set in one week arrangements are made with the owners to buy the sets and deduct a weekly payment from the mechanic's wages.

As a further step toward uniformity, selection of a set of wrenches adapted to the work in any given shop is made after a study of requirements. These are listed and a mechanic who wishes to buy a set of wrenches need not concern himself with the make-up of the set.

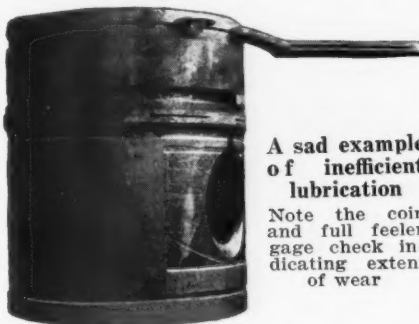
Close contact with all shops and service stations is maintained by Motor Specialty Co. factory branches. Visits are scheduled so that outlying districts are visited approximately every six weeks. Larger city shops are visited every few days.

Special wrench combinations for difficult operations are worked out whenever desired. When new models of trucks or buses are put on the market mechanics soon find out whether any special tools are needed to service them. In case of difficulty various combinations are tried or special wrenches made for the operation. Many wrenches now included in the Snap-On assortments were originally made as "specials" for difficult jobs.

Consider Operating Conditions When Selecting Oil

Operating conditions must be taken into account when selecting engine oil. This fact was forcibly brought to the attention of a truck owner when his engine "went bad" after less than three months' service.

Top rings worn so much that a five cent piece could be inserted between



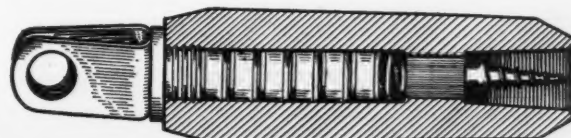
ring and groove and pistons badly worn were revealed when the engine was torn down.

Lack of lubrication was plainly manifested, but the owner insisted that the engine always had plenty of oil. Further questioning brought out the fact that he had been using a special extra heavy oil.

The truck was a heavy-duty one with dump body. It was used for carting dirt and long waits under a steam shovel occupied a large part of every working day.

Long periods of idling and extra heavy oil did not make a good combination. The oil, adapted for use in air cooled engines or tractors, did not atomize under the operating conditions and pistons and cylinder walls suffered from lack of lubrication.

Sectional view of Lepel converter



The salesman who sold the oil to the owner pointed out the need for heavy oil for heavy duty engines but overlooked the fact that operating conditions must also be taken into account.

The owner of the truck was displeased when he was called upon to pay for the work although the guarantee period had not elapsed, but the factory branch service manager pointed out that use of improper grade of oil was the fault of the owner and not the manufacturer.

Lepel Spark Converter

This device is designed to modify the character of the spark of battery and magneto systems, especially at high engine speeds. It is marketed by the Lepel Ignition Corporation, 117 W. 63rd St., New York.

The device consists of a moulded body of Bakelite into which are inserted a number of aluminum disks or buttons separated a distance of about .001 in. by mica rings or washers. A wood screw serves as a connector to the ignition cable and is moulded into the body at one end, while a snap clip suitable for attachment of the converter to the spark plug is fastened to the other end. The spark in passing to the spark plug is compelled to jump a series of exceedingly short gaps, whereby its character is influenced with a resultant reaction on the ignition coils.

The effect of the converter is being demonstrated by means of a revolving spark gap as used in testing ignition apparatus. The high tension current impulses are conducted to the terminals of this revolving gap by means of one sliding insulated and one grounded lead, the spark appearing on the disk of the device as an arc-shaped streak intensely bright at one end, and tapering down in brightness toward the other end known as the "tail." This is the ordinary spark as furnished by the conventional battery or magneto system.

When a Lepel converter is inserted in the circuit the demonstration shows that the spark assumes different characteristics. The duration of the discharge is materially decreased, by at least one-half with battery systems and with a magneto to about one-sixth and less under compression. At the same time the intensity is increased and is substantially uniform during the duration of the spark, instead of "trailing off" with the usual tail. A milliammeter placed in the secondary coil circuit shows an approximate doubling of the current flow with the Lepel device in the circuit, and an ammeter in the primary circuit of the battery system shows that this is accomplished with no increase in primary current.

for Economical Transportation

“—never Fails to Pull Through the Heaviest of Deep Sand”

Each day brings to light some new record of the remarkable economy of Chevrolet truck units—some new measure of their amazing endurance and reliability in every field of activity!

The most recent evidence of the reasons underlying Chevrolet's ever-increasing popularity in the oil field is supplied in a letter from Mr. R. O. Brittan, Sinclair Refining Co., Live Oak, Fla. He says:

“Our Chevrolet 1-ton truck is equipped with a three compartment tank of 352-gallon capacity and handles peak loads entirely to our satisfaction. The truck has run 3400 miles over rough, sand clay roads and never fails to pull through the heaviest of deep sand, the average 25 miles to the gallon of gas and 500 miles per quart of oil. ‘Economical Transportation’ seems to be a very fitting slogan for this truck!”

If you're in the market for new or additional delivery

equipment you can safely let the experience of the Sinclair Refining Co. guide you in your purchase—because their success with Chevrolet trucks is typical of the satisfaction enjoyed by Chevrolet owners everywhere!

Providing such essential truck-type advantages as rigidly braced channel steel frame; extra-leaved rear springs set parallel to the load; oversize brakes; extra strong rear axle; reliable semi-reversible steering control; positive three-speed transmission; powerful valve-in-head motor; water pump and combination pump and splash system of lubrication, the Chevrolet ton or 1/2-ton truck can't fail to give you uninterrupted delivery service at low cost. See your nearest Chevrolet dealer—get all the facts and figures—ask for a demonstration! Then you will understand why refining companies all over America are standardizing on Chevrolet!

CHEVROLET MOTOR COMPANY, DETROIT, MICHIGAN
Division of General Motors

1/2-Ton Truck (Chassis Only) \$375

1-Ton Truck (Chassis Only) \$495

Prices F. O. B. Flint, Michigan

World's Lowest Priced Gear-shift Trucks



EDITORIALS



Needs Watching

NOW that the hearings of the Interstate Commerce Commission on the subject of motor truck and bus regulation are nearly completed, the industry is speculating upon what kind of regulation will be asked for at the next session of Congress. Although much of the testimony gathered indicates that truck regulation is not sought as much as bus regulation, there is no use taking it for granted that truck regulation is going to be pigeon-holed. As some railroads have expressed it, while Federal regulation of motor truck common carriers may not be favored at the present time it will have to come eventually.

In most of the testimony presented, the economic need of the motor trucking industry was stressed, that it was a young industry and that Federal control would handicap its normal development for many years. But lest we forget the *motor bus industry is still younger* than the trucking business.

Figures presented during the hearings show that the railroads are today hauling more freight and showing greater profits in that department than at any time since the war. The evidence presented at practically all of the hearings expressed the futility of Federal regulation of the motor trucking business. On the other hand regulation of the motor bus was more or less agreed upon. Does that not seem to indicate that the interests which are agitating for Federal control of bus lines are having the whole proposition work out practically as they want it?

Once motor buses are placed under Federal regulation how long will it be before motor trucks will be under the same control? Undoubtedly there will be a bus bill drafted for the next session of Congress, but does the bus industry need Federal regulation? How is it that the interests which want bus control are more or less agreed to forget the Federal regulation of motor trucks at present? It looks as if half a cake is better than none.

Certainly the truck and bus interests would do well to carefully watch the developments of this situation between now and next session of Congress. There may be some surprises forthcoming.

Safety First

STATISTICS available show that the most serious accidents to buses occur on intercity routes. That this should be so is not to be wondered at for it is on the main highways that the reckless speed merchant and drunken drivers are in a position to do the most damage.

In the cities speeds are lower and the traffic controlled, but the open roads, regardless of turns and crossings, fires the ambitions of the motor maniacs and morons.

Most of these bus accidents are ditchings, some serious and some otherwise, but many of them inevitable as a result of fool driving by parties of the third part. In these cases all that the bus operator can do is to insure that his vehicles are mechanically sound and that the drivers are in good mental and physical condition at all times.

A prominent middle-states operator keeps his men fit and free from fatigue on long runs by making them stop and get out of the bus every 15 miles to punch a clock. This also serves as a check and prevents them speeding to make up schedule time, because any cutting of time between clocking points means dismissal.

How the seriousness of an accident may be affected by the detail of chassis construction is exemplified by the experience of another operator. This man had one of his 23 seaters overturn and kill 3 when the forward end of a front spring broke. The manufacturer of that chassis has now altered the spring anchorage design so that in the event of a front spring breaking the axle cannot move backward more than an inch or so.

Obviously, bus manufacturers are not responsible for accidents but anything they can do to insure safety by correcting faulty design or increasing the factor of safety in certain units should prove of greater interest to the bus operator than adding new models or making improvements which fundamentally mean little in the life of the bus chassis.

Future Issues of C. C. J.

PRELIMINARY details on the *American Road Builder's Show* will be featured in the December issue and a *Commercial Car and Equipment Review* of the *National Show* (New York) in the January issue.

Timken Flat Rate Prices on Axle Units

The prices given in this table cover all labor and material costs for repairing a unit under a given classification by the Timken-Detroit Axle Company at its factory. The prices are list f.o.b. factory and subject to five per cent cash discount. Twelve classes of overhaul on motor coach and truck axles are given.

Worm Drive—Rear Axles— Housings—Full Floating Type

CLASS No. 21	Axle Series	List Price
Install new housing; rivet brake spider; furnish new carrier and housing gasket; rebabbitt or replace brake camshaft bracket; inspect and paint.	6500	\$70.00
	6600	76.00
	6700	113.00

CLASS No. 22	Axle Series	List Price
Install new housing tubes; install new brake spiders (rivet if necessary); furnish new carrier and housing gasket; rebabbitt or replace brake camshaft bracket; furnish all new gaskets; install new carrier to housing cap screws and lock washer (assemble in place); retap carrier to housing cap screw holes; inspect and paint.	6500	118.00
	6600	124.00
	6700	150.00

CLASS No. 23	Axle Series	List Price
Install new housing; install new housing tubes; rivet old brake spider to new housing, or furnish new parts if necessary; install new brake spiders (rivet if necessary); furnish new carrier and housing gasket; rebabbitt or replace brake camshaft bracket; furnish all new gaskets; install new carrier to housing cap screws and lock washers (assemble in place); retap carrier to housing cap screw holes; inspect and paint.	6500	200.00
	6600	240.00
	6700	275.00

CLASS No. 24	Axle Series	List Price
Install new brake cams; install new brake shoe springs; reline or replace old brake shoes; install new housing; install new housing tubes; rivet old brake spiders to new housing, or furnish new parts if necessary; furnish new carrier and housing gasket; rebabbitt or replace brake camshaft bracket; furnish all new gaskets; install new carrier to housing cap screws and lock washers (assemble in place); retap carrier to housing cap screw holes; inspect and paint.	6500	300.00
	6600	336.00
	6700	375.00

Worm Drive—Rear Axles— Carrier Assemblies

CLASS No. 11	Axle Series	List Price
Rivert old worm wheel to differential; replace any or all bearing cones and cups; repack or replace any worn oil seal parts; furnish any necessary new gaskets; make all necessary adjustments; test, inspect and paint.	6200	\$18.50
	6300	21.60
	6400	25.00
	6500	30.50
	6600	34.50
	6700	40.50

CLASS No. 12	Axle Series	List Price
Rivert old worm wheel to differential, if necessary; replace any or all bearing cones and cups; repack or replace any worn oil seal parts; furnish any necessary new gaskets; make all necessary adjustments; install new worm wheel, if necessary; install new worm shaft, if necessary; test, inspect and paint.	6200	70.00
	6300	72.00
	6400	109.00
	6500	128.00
	6600	170.00
	6700	219.00

CLASS No. 13	Axle Series	List Price
Rivert old worm wheel to differential, if necessary; replace any or all bearing cones and cups; repack or replace any worn oil seal parts; furnish any necessary new gaskets; make all necessary adjustments; install new worm wheel, if necessary; install new worm shaft, if necessary; install all necessary differential parts, including cases, if necessary; test, inspect and paint.	6200	124.00
	6300	128.00
	6400	146.00
	6500	192.00
	6600	223.00
	6700	284.50

CLASS No. 14	Axle Series	List Price
Rivert old worm wheel to differential, if necessary; replace any or all bearing cones and cups; repack or replace any worn oil seal parts; furnish any necessary new gaskets; make all necessary adjustments; install new worm wheel, if necessary; install new worm shaft, if necessary; install all necessary differential parts, including cases, if necessary; install new carrier and cap assembly, if necessary; test, inspect and paint.	6200	155.00
	6300	156.00
	6400	168.25
	6500	218.00
	6600	288.40
	6700	399.00

Worm Drive—Rear Axles— Housings—Fixed Hub Type

CLASS No. 31	Axle Series	List Price
Rivert old brake spider to housing; furnish new carrier and housing gasket; rebabbitt or replace brake camshaft bracket; inspect and paint.	6200	\$15.00
	6300	18.00
	6400	19.50
	6500	22.50

CLASS No. 32	Axle Series	List Price
Install new brake spiders (rivert if necessary); furnish new carrier and housing gasket; rebabbitt or replace brake camshaft bracket; furnish all new gaskets; install new carrier to housing cap screws and lock washer (assemble in place); retap carrier to housing cap screw holes; inspect and paint.	6200	66.00
	6300	68.00
	6400	73.50
	6500	80.00

CLASS No. 33	Axle Series	List Price
Install new housing; rivert old brake spider to new housing, or furnish new parts if necessary; install new brake spiders (rivert if necessary); furnish new carrier and housing gasket; rebabbitt or replace brake camshaft bracket; furnish all new gaskets; install new carrier to housing cap screws and lock washer (assemble in place); retap carrier to housing cap screw holes; inspect and paint.	6200	97.00
	6300	101.00
	6400	224.50
	6500	240.00

CLASS No. 34	Axle Series	List Price
Install new brake cams; install new brake shoe springs; reline or replace old brake shoes; install new housing; rivert old brake spiders to new housing or furnish new parts if necessary; furnish new carrier and housing gasket; rebabbitt or replace brake camshaft bracket; furnish all new gaskets; install new carrier to housing cap screws and lock washers (assemble in place); retap carrier to housing cap screw holes; inspect and paint.	6200	122.00
	6300	125.00
	6400	275.00
	6500	290.00

Commercial Car Specifications—Corrected Monthly

The Specifications, Chassis Prices, Etc., Are Corrected Each Month From Data Supplied Direct by the Makers. Gasoline Tractor-Trucks Will be Found at the End of Gasoline Commercial Cars

Those Chassis Which Are Sold and Recommended for Bus Use Are Designated in the Following Table by Reference Sign (\$) in Front of the Name

For Motor Bus Chassis See Pages 36 and 37

(Where prices are not given it is because we have been unable to get them from authoritative sources)

Key of abbreviations, page 38

Trade Name and Model	General			Engine					Electrical System		Clutch	Gearset		Rear Axle		Gear Ratios		Front Axle Make and Model	Springs (Make)	Steering Gear (Make)	Wheels (Make)	Rims (Make)	Chassis Weight (lbs.)																																																																																																																	
	Standard Wheelbase (inches)	Tire Size (inches)		Bore and Stroke	N.A.C.C. Rated H.P.	Valve Arrangement	Oiling System	Governor (Make)	Radiator (Make)	Fuel System (Make)		Location	No. of Forward Speeds	Universals (Make)	Make and Model	Type	Total Reduction in High							Total Reduction in Low																																																																																																																
		Front	Rear							Carburetor	Fuel Feed																																																																																																																													
1000 Pounds Chevrolet Std. Com. Ch. Star Four Com. Ch.	375 103 470 103	P 30x3 1/2 P 30x3 1/2	P 30x3 1/2 P 30x3 1/2	4-3 3/8x4 1/2 4-3 3/8x4 1/2	21 7/8 18 1/2	H L	PS PC	Non Non	Har Fed	Car Til	V V	U A	3 3	Own Spi	Own Sup Own	P. Own P. Own	2.82 4.87	12.7 16.16	SS SS	Own Sup Own	S.S Own	Own Own	Hay Hay	Jax Hay	1400 1500																																																																																																															
	670 116 895 118 2150 133 1/2 1295 109	P 31x5 25 P 31x4 P 30x5 25 P 34x5	P 31x5 25 P 32x4 1/2 P 30x5 25 P 29x4 1/2	4-3 3/8x4 1/2 4-3 3/8x4 1/2 4-3 3/8x4 1/2 4-3 3/8x5	24 0 19 6/8 18 1/2 22 5/8	L L L L	PS PC PC SP	Non Non Non Non	McC Lon Own Lon	Ste Zen Zen Zen	Ste Zen Zen Zen	G G G G	U U U U	3 3 3 Spi	Own Own Own 15 Own 5331	D. Own Roc P. Own B-L	4.16 4.45 30.0 4.90	17.21 B 18.6 16.3	Bea Own Own Mar	Own Eat Own Tun 1341	Bea D-G Own Own	Own Own Hoo Gem	Kel Fir Hoo Fir	2202 2000 2250 3225 2500																																																																																																																
	2050 144 152 120 1595 125 1700 130	P 34x5 P 30x5 S 34x4 1/2 P 33x5 P 34x5	P 34x5 P 30x5 S 34x4 1/2 P 33x5 P 34x5	4-4 1/2x4 1/2 4-3 3/8x4 1/2 4-3 3/8x4 1/2 4-3 3/8x4 1/2 4-3 3/8x4 1/2	28 9/16 23 4/8 18 1/2 19 6/8 22 5/8	L L L L L	FP SP SP PC PC	Non Non Non Non Non	Chi Fed Own Bus G&O	Chi Zen Zen Zen Zen	Zen Zen Zen Zen Zen	Zen Zen Zen Zen Zen	G G G G G	U A U U U	3 3 3 3 Spi	Cla 366 Cla F Own F Eat 1000 Own 5200	D. Ful B-L Own F B-L B-L	5.66 3.10 8.30 6.86 5.5	22.6 17.03 33.2 27.4 23.4	Own Sup Own F Own F Eat 750 Col 5000	Shu 310 Shu F Own F Eat 750 Col 5000	Tut She Del Del Mat	Ros Gem Ros Ros Cia	Bim Hoo Hoo Van Cia	Fir Hoo Van Cia	3600 3200 3800 3900 3300																																																																																																														
	1700 130 132 140 130 1750 130	P 30x3 1/2 P 30x5 P 34x5 P 30x5 P 30x5	P 30x3 1/2 P 30x5 P 34x5 P 30x5 P 30x5	P 30x3 1/2 P 30x5 P 34x5 P 30x5 P 30x5	4-3 3/8x4 1/2 4-3 3/8x4 1/2 4-3 3/8x4 1/2 4-3 3/8x4 1/2 4-3 3/8x4 1/2	21 7/8 25 6/8 23 4/8 25 3/8 25 3/8	H L L L L	PC PC PC PC PC	Non Non Non Non Non	Har Own Own McC Own	Car Zen Zen Zen Zen	Car Zen Zen Zen Zen	G G G G G	U U U U U	3 3 3 3 Spi	Own Sup Own Sup Own Sup Tun 5620 Tun 5620	D. Own P. Own P. Own B-L B-L	5.5 5.43 5.66 6.43 5.66	22.6 18.0 27.16 30.86 20.5	Own Sup Own Sup Own Sup Tun 1250 Tun 1250	Col 5000 Col 5000 Col 5000 Tun 1250 Tun 1250	SS SS SS Per Per	Own Sup Own Sup Own Sup Mat Mat	Per Woh Per Woh Per	Own Own Own Own Own	Jax Jax Jax Jax Jax	1985 3240 3450 2900 3025																																																																																																													
	2400 0pt Diamond 176. Dorris K-2. Duplex G. Federal Knight. Ford T. Express.	130 128 136 132 124 136	P 30x5 P 30x5 P 30x5 P 30x5 P 32x4 1/2 P 30x5	P 30x5 P 30x5 P 30x5 P 30x5 P 32x4 1/2 P 30x5	4-3 3/8x4 1/2 4-3 3/8x4 1/2 4-3 3/8x4 1/2 4-3 3/8x4 1/2 4-3 3/8x4 1/2 4-3 3/8x4 1/2	25 6/8 25 6/8 25 6/8 25 6/8 22 1/2 18 1/2	L L L L X L	PC PC PC PC FC SP	Non Non Non Non Non Non	Own Own Own Own Own Own	Zen Zen Zen Zen Zen Zen	Zen Zen Zen Zen Zen Zen	G G G G G G	U U U U U U	3 3 3 3 3 3	Own Sup Own Sup Own Sup Own Sup Own Sup Own Sup	D. Own P. Own P. Own B-L B-L B-L	5.5 5.5 5.5 5.5 6.11 5.5	22.6 22.6 22.6 22.6 22.0 22.3	Own Sup Own Sup Own Sup Own Sup Own Sup Own Sup	Sal F Sal F Sal F Sal F Sal F Sal F	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own	Own Own Own Own Own Own

Key of abbreviations, page 38

Trade Name and Model	General				Engine					Electrical System		Clutch	Gearset		Rear Axle		Front Axle Make and Model	Springs (Make)	Steering Gear (Make)	Wheels (Make)	Rims (Make)	Chassis Weight (lbs.)						
	Chassis Price	Tire Size		Make and Model	Number of Cylinders	N.A.C.C. Rated H.P.	Valve Arrangement	Oiling System	Governor (Make)	Radiator (Make)	Fuel System		Electrical System															
		Stand-rod Wheelbase (Inches)	Rear (Inches)								Ignition System (Make)		Generator and Starter (Make)	Type and Make	Make and Model	Location							No. of Forward Speeds	Universals (Make)	Type	Gear Ratios		
																										Total Reduction in High	Total Reduction in Low	Brakes, Location
1 Ton—Cont'd																												
Larabee A3.....	133	P 30x5	Con S4	6-3/4x4 1/2	25 3/4	25 3/4	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	17.1	She	Gem	Smi	Fir	2600
LeMoon GP-1.....	151	P 34x5	Wau V	4-1/2x4 1/2	28 9/16	28 9/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.6	17.1	Tut	Gem	Smi	Fir	2700
Luchinghaus.....	130	P 34x4 1/2	Bud WTU	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	2650
Master 11B.....	132	P 33x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	2625
Menominee.....	132	P 34x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	3400
Nash 2018.....	1505	S 34x5 1/2	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	3400
Noble A-76.....	1775	S 30x5 1/2	Bud WTU	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	3100
Ogden A-2.....	125	P 34x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	3250
Ogden A-2.....	125	P 34x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	3250
O. K. Chariot.....	1790	P 34x5	Bud WTU	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	3000
Farker Chariot.....	120	S 33x5	Her OX	4-4x5	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	3000
Sandow GA.....	130	S 32x6	Wau V	4-4x5	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	3755
Sandow GA.....	132	P 30x5	Bud WTU	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	3900
Schacht.....	975	P 32x6	Wau V	4-3/4x4 1/2	18 1/16	18 1/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	3900
Star Fleettruck.....	128	P 30x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	2700
Stewart 16.....	1245	P 30x5 1/2	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	3400
U. S. U.....	1850	P 34x5	Bud WTU	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	2400
Wachusett S.....	152	S 34x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	3300
Yellow Cab T-1.....	1450	P 33x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	3210
Yellow Knight T2.....	1095	P 30x5	Km V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.0	17.1	Tut	Gem	Smi	Fir	2740
1 1/4 Ton																												
Acme 24.....	130	P 30x5	Con S4	4-1/4x4 1/2	28 9/16	28 9/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3200
Autocar F.....	97	S 34x4 1/2	Wau V	2-4/4x4 1/2	18 1/16	18 1/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3800
Autocar G.....	120	S 34x4 1/2	Wau V	2-4/4x4 1/2	18 1/16	18 1/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3900
Biedeman.....	154	P 34x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3600
Clinton 20B.....	153	P 30x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3750
Clinton 20.....	154	P 34x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3750
Clydesdale 10A.....	154	P 34x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3750
Defiance G2.....	128	P 34x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3250
Defiance G2.....	128	P 34x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3250
Federal R33.....	1675	P 33x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	2900
Gramm 233 N.....	133	P 30x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3455
Gramm 263 N.....	133	P 30x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3555
Guider B-6.....	132	P 30x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3555
Gramm-Bernstein 10.....	129	P 30x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3000
Guider B-6.....	132	P 30x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3000
Guider B-6.....	132	P 30x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3000
Hahn B2.....	1650	P 32x5 1/2	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	2800
Intert'l Harvester S.....	124	P 32x4 1/2	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3000
Int. Harvester S-24.....	130	P 32x4 1/2	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3000
Int. Harvester S-26.....	130	P 32x4 1/2	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3000
Lauger K.....	1850	P 32x6	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3000
Maeder 11.....	132	P 33x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3000
Maeder 11.....	132	P 33x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3000
Menominee HT.....	130	P 30x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3000
Patriot 17R.....	129	P 30x5	Wau V	4-3/4x4 1/2	25 6/16	25 6/16	PC	Non	Non	Per	Zen	G G	Rem	Rem	D, B-L	B-L	U	3	Spi	Sal	Sal	5.10	20.9	Det	Ros	Smi	Fir	3000

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Key of abbreviations, page 38

Trade Name and Model	General			Engine					Electrical System		Clutch	Gearset		Rear Axle		Front Axle Make and Model	Springs (Make)	Wheels (Make)	Rims (Make)	Chassis Weight (lbs.)					
	Standard Wheelbase (inches)	Tire Size (inches)		Make and Model	Number of Cylinders	N.A.C.C. Rated H.P.	Valve Arrangement	Oiling System	Governor (Make)	Radiator (Make)	Carburetor (Make)	Fuel Feed	Ignition System (Make)	Generator and Starter (Make)											
		Front (inches)	Rear (inches)																						
Pendell B (low bed).	3000 156	P 30x5	P 32x6	Her CT	4-4x5	25.6 L	PC	PC	Non	Own	Str	G	A-L	A-L	D. Ful	Ful SU12	U	U	U	U					
Republic 88.	1460	P 32x6	P 34x6	Lyc OX	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Ruggles 22.	152	P 32x6	P 34x6	Bud CTU	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Rumely A.	2150 144	P 30x5	P 32x6	Her OX	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Sandow.	138	P 30x5	P 32x6	Con 8R	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Sanford W-6-12.	2500 144	P 30x5	P 32x6	Wau V	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Service.	149	P 30x5	P 32x6	Bud KBU-1	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Steinkoenig A.	142	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Sterling DW-3	1695 145	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Stewart 17X.	1795 145	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Stoughton B.	140	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Stoughton J.	140	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Taylor B.	1800 140	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Union E.	1900 143	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
U. S. N.	2100 143	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Victor 40.	1995 135	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Wachet J.	2550 156	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Wilcox H.	1340 136	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Winter 16.	2275 144	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Witt-Will N.	2575 144	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
2 Ton	2500 147	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Acorn.	144	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Autoear.	120	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Autoear F.	114	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Autoear H.	138	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Autoear G.	2495 137 1/2	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Bethlehem GN.	148	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Bridgeport AT.	148	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Brookway SK.	150	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Brookway ST.	150	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Buck 46.	160	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Casco C.	2700 130	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Casco D.	2950 170	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Climont 45.	163	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Clydesdale 9.	146	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Commander S14.	2800 155	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Commodore GX.	148	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Corbett 40.	148	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Day Elder H.	144	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Day Elder HSM.	144	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Defiance E2.	2800 136	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Dixon.	168	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Douglas.	168	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Douglas A.	118	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Duplex A.	160	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Eagle 102.	134	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Federal S1.	144	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Gottfredson 41.	146 1/2	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Gottfredson 46.	145 1/2	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Graham Bros. OC.	1445 137	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Graham Bros. OCR.	1445 137	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Graham Bros. TC.	1515 162	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Graham Bros. TCR.	1515 162	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Graham 443N.	133	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Graham 463N.	133	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					
Graham Bernstein 115S.	149 1/2	P 30x5	P 32x6	Lyc C	4-4x5	22.8 L	PC	PC	Non	Per	Str	G	Bos	Bos	D. B-L	Ful 31	U	U	U	U					

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Year	Month	Day	Time	Location	Event	Result	Score	Notes
1957	Jan	1	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 1 of series
1957	Jan	2	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 2 of series
1957	Jan	3	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 3 of series
1957	Jan	4	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 4 of series
1957	Jan	5	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 5 of series
1957	Jan	6	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 6 of series
1957	Jan	7	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 7 of series
1957	Jan	8	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 8 of series
1957	Jan	9	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 9 of series
1957	Jan	10	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 10 of series
1957	Jan	11	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 11 of series
1957	Jan	12	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 12 of series
1957	Jan	13	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 13 of series
1957	Jan	14	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 14 of series
1957	Jan	15	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 15 of series
1957	Jan	16	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 16 of series
1957	Jan	17	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 17 of series
1957	Jan	18	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 18 of series
1957	Jan	19	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 19 of series
1957	Jan	20	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 20 of series
1957	Jan	21	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 21 of series
1957	Jan	22	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 22 of series
1957	Jan	23	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 23 of series
1957	Jan	24	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 24 of series
1957	Jan	25	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 25 of series
1957	Jan	26	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 26 of series
1957	Jan	27	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 27 of series
1957	Jan	28	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 28 of series
1957	Jan	29	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 29 of series
1957	Jan	30	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 30 of series
1957	Jan	31	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 31 of series
1957	Feb	1	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 32 of series
1957	Feb	2	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 33 of series
1957	Feb	3	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 34 of series
1957	Feb	4	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 35 of series
1957	Feb	5	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 36 of series
1957	Feb	6	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 37 of series
1957	Feb	7	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 38 of series
1957	Feb	8	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 39 of series
1957	Feb	9	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 40 of series
1957	Feb	10	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 41 of series
1957	Feb	11	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 42 of series
1957	Feb	12	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 43 of series
1957	Feb	13	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 44 of series
1957	Feb	14	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 45 of series
1957	Feb	15	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 46 of series
1957	Feb	16	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 47 of series
1957	Feb	17	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 48 of series
1957	Feb	18	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 49 of series
1957	Feb	19	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 50 of series
1957	Feb	20	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 51 of series
1957	Feb	21	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 52 of series
1957	Feb	22	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 53 of series
1957	Feb	23	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 54 of series
1957	Feb	24	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 55 of series
1957	Feb	25	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 56 of series
1957	Feb	26	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 57 of series
1957	Feb	27	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 58 of series
1957	Feb	28	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 59 of series
1957	Feb	29	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 60 of series
1957	Feb	30	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 61 of series
1957	Feb	31	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 62 of series
1957	Mar	1	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 63 of series
1957	Mar	2	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 64 of series
1957	Mar	3	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 65 of series
1957	Mar	4	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 66 of series
1957	Mar	5	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 67 of series
1957	Mar	6	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 68 of series
1957	Mar	7	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 69 of series
1957	Mar	8	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 70 of series
1957	Mar	9	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 71 of series
1957	Mar	10	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 72 of series
1957	Mar	11	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 73 of series
1957	Mar	12	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 74 of series
1957	Mar	13	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 75 of series
1957	Mar	14	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 76 of series
1957	Mar	15	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 77 of series
1957	Mar	16	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 78 of series
1957	Mar	17	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 79 of series
1957	Mar	18	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 80 of series
1957	Mar	19	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 81 of series
1957	Mar	20	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 82 of series
1957	Mar	21	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 83 of series
1957	Mar	22	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 84 of series
1957	Mar	23	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 85 of series
1957	Mar	24	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 86 of series
1957	Mar	25	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 87 of series
1957	Mar	26	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 88 of series
1957	Mar	27	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 89 of series
1957	Mar	28	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 90 of series
1957	Mar	29	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 91 of series
1957	Mar	30	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 92 of series
1957	Mar	31	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 93 of series
1957	Apr	1	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 94 of series
1957	Apr	2	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 95 of series
1957	Apr	3	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 96 of series
1957	Apr	4	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 97 of series
1957	Apr	5	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 98 of series
1957	Apr	6	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 99 of series
1957	Apr	7	10:00	St. Louis	Baseball	St. Louis Cardinals	100	Game 100 of series

3½ Ton

[illegible]

1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100

[illegible]

Gasoline Tractor-Trucks—Continued

[illegible]

Motor Bus Chassis Specifications

For Other Chassis Which Are Recommended and Adaptable for Bus Use, See Models Having Sign (§) in the "COMMERCIAL CAR SPECIFICATIONS"

Key of abbreviations, page 38

MAKE AND MODEL	GENERAL			ENGINE		ELECTRICAL SYSTEM			TRANSMISSION			REAR AXLE		FRONT AXLE		TIRES AND WHEELS		DIMENSIONS (In.)								
	WEIGHT			Make and Model	Number of Cylinders	Radiator Make	Carburetor Make	Ignition System		Voltage and Amp. Hr. Cap.	Normal Speed	GEARSET		Make and Model	Final Drive	Brake Location	Steering Gear	TIRES (In.)		Turning Radius (Ft.)	Floor Height	Length	Width			
	Seating Capacity	Chassis Only	Chassis with Body					Recommended Body Allowance	Wheelbase			Make	Generator and Starter					Battery	Type and Make					Make and Model	Number of Forward Speeds	Universal Make
30	6500	11500	5000	204	Con 7T	6-41x55 9	Own	Zen	Eis	USL	12-110	35	6.0	D-B-L	B-L 55	Tim 6516	A	Tim 1550	Roe	P 36x6	DP 36x6	Bud	31 1/2	90		
18	4910	8460	2005	120	Con 6B	6-33x55 6	Per	Zen	Eis	Will	6-153	45	6.0	D-B-L	B-L 51	Shu	A	Tim 1550	Roe	P 32x6	DP 32x6	Bud	29 1/2	83 1/2		
25	8100	1280	195	121	Con 7T	6-41x55 1	Str	Zen	Eis	Will	6-153	45	6.0	D-B-L	B-L 55	Shu	A	Tim 1550	Roe	P 32x6	DP 32x6	Bud	29 1/2	83 1/2		
25	8100	1280	195	121	Con 7T	6-41x55 1	Str	Zen	Eis	Will	6-153	45	6.0	D-B-L	B-L 55	Shu	A	Tim 1550	Roe	P 32x6	DP 32x6	Bud	29 1/2	83 1/2		
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25	8100	1280	195	121	Con 7T	6-41x55 1	Str	Zen	Eis	Will	6-153	45														

[illegible]

KEY OF ABBREVIATIONS

Wheelbase:

°—More than one wheelbase furnished.

Tires:

B—Balloons.
P—Pneumatics standard equipment.
S—Solids.
DP—Dual pneumatics standard equipment.
DS—Dual solids.
† This sign after tire size indicates that pneumatics can be furnished at extra cost.

Engine:

Bud—Buda Co., Harvey, Ill.
Con—Continental M. Corp., Detroit, Mich.
D—Head and Side.
FP—Full Pressure to all bearings including wrist pins.
H—Overhead.
HaS—Hall-Scott Motor Car Co., Berkeley, Cal.
Her—Hercules Motors Corp., Canton, Ohio.
Himico—Hinkley Motors & Parts Corp., Jackson, Mich.
Hin—Hinkley Motors & Parts Corp., Jackson, Mich.
I—In Head.
J—Master Motor Truck Mfg. Co., Chicago, Ill.
Kni—Yellow Sleeve Valve Eng. Works, East Moline, Ill.
L—L-Head.
Lyc—Lycoming M. Corp., Williamsport, Pa.
PC—Pressure to all crankshaft and connecting-rod bearings.
PS—Pressure with splash.
SP—Circulating splash.
T—T-Head.
Wau—Waukesha M. Co., Waukesha, Wis.
Wis—Wisconsin M. Mfg. Co., Milwaukee, Wis.
Yell—Yellow Sleeve V. E. Works, E. Moline, Ill.
X—Sleeve.

Governor:

Con—Continental M. Corp., Detroit, Mich.
Dup—Eisemann Magneto Corp., New York.
Han—Handy Gov. Co., Detroit, Mich.
Hin—Hinkley Motors & Parts Corp., Jackson, Mich.
K. P.—K. P. Products Co., New York, N. Y.
McC—E. R. Klemm, Chicago, Ill.
Mon—Monarch Gov. Co., Detroit, Mich.
Non—Not Supplied.
Pha—Pharo Mfg. Co., Bethlehem, Pa.
Pie—Pierce Governor Co., Anderson, Ind.
Sim—Eisemann Magneto Corp., New York.
Tac—Tractor Appliance Co., New Holstein, Wis.
Wau—Waukesha M. Co., Waukesha, Wis.

Radiator:

Bus—Bush Mfg. Co., Hartford, Conn.
Chi—Chicago Mfg. Co., Chicago, Ill.
E-M—English & Mersick Co., New Haven, Conn.
Fed—Feddars Mfg. Co., Buffalo, N. Y.
Flexo—Flexo Mfg. Co., Los Angeles, Cal.
G&O—G. & O. Mfg. Co., New Haven, Conn.
Har—Harrison Rad. Corp., Lockport, N. Y.
Idl—Ideal Sheet Metal Works, Chicago, Ill.
Liv—Livingston Rad. Corp., Plainfield, N. J.
Lon—Long Mfg. Co., Detroit, Mich.
McC—McCord Rad. & Mfg. Co., Detroit, Mich.
McK—McKinnon Dash Co., Buffalo, N. Y.
Mod—Modine Mfg. Co., Racine, Wis.
Per—Racine Radiator Co., Racine, Wis.
R-T—Rome-Turney Rad. Co., Rome, N. Y.
Spa—Sparks-Withington Co., Jackson, Mich.
Str—Standard Radiator Co., Inc., Springfield, N. Y.
Tyr—Tyree Auto Rad. Mfg. Co., Chicago, Ill.
U. S.—U. S. Cartridge Co., Lowell, Mass.

Fuel System:

B.E.—Penberthy Injector Co., Detroit, Mich.
Car—Carter Carburetor Co., St. Louis, Mo.
Ens—Ensign Car. Co., Los Angeles, Cal.
G—Gravity.
Hol—Holley Carburetor Co., Detroit, Mich.
Joh—Johnson Co., Detroit, Mich.
Mar—Marvel Carburetor Co., Flint, Mich.
P—Pressure.
Ray—Beneke Mfg. Co., Chicago, Ill.
Sch—Wheeler Schebler Carburetor Co., Indianapolis, Ind.
Ste—Detroit Lubricator Co., Detroit, Mich.
Str—Stromberg Motor Devices Co., Chicago, Ill.
Til—Tillotson Mfg. Co., Toledo, Ohio.
V—Vacuum.
Zen—Zenith-Detroit Corp., Detroit, Mich.

Electrical Systems:

†—Generator & Starter at Extra Cost.
†—Starter not supplied, Generator at Extra Cost.
*—Starter at Extra Cost.
A-L—Electric Auto-Lite Corp., Toledo, O.
Alc—Cincinnati S. B. Co., Cincinnati, O.
Apo—Apolo Magneto Corp., Kingston, N. Y.
Bij—Bijur Motor Appliance Co., Hoboken, N. J.
Bos—American Bosch Magneto Co., Springfield, Mass.
Con—Connecticut Telephone & Electric Co., Meriden, Conn.
Del—Delco-Remy Corp., Dayton, Ohio.
DJ—DeJohn Elec. Corp., Toledo, Ohio.
Dyn—Owen Dyneto Corp., Syracuse, N. Y.
Eis—Eisemann Magneto Corp., New York.
Eli—Electric S. B. Co., Phila., Pa.
G&D—Gray & Davis, Boston, Mass.
Gou—Gould S. B. Co., New York.
Hob—Hobbs Battery Co., Los Angeles, Cal.
L-N—Leece-Neville Co., Cleveland, Ohio.
N-E—North East Elect. Co., Rochester, N. Y.
Non—Not Supplied.
Pol—Prest-O-Lite Co., Indianapolis, Ind.
Rem—Delco-Remy Corp., Anderson, Ind.
RBo—Robert Bosch Magneto Co., New York, N. Y.
Sci—Scintilla Magneto Co., Sidney, N. Y.
Sim—Simms Magneto Co., E. Orange, N. J.
Spl—Splitorf Electrical Co., Newark, N. J.
USL—U. S. Light & Heat Corp., Niagara Falls, N. Y.
Ves—Vesta Battery Corp., Chicago, Ill.
Wes—Westinghouse Elec. & Mfg. Co., Springfield, Mass.
Wil—Willard S. B. Co., Cleveland, Ohio.

Clutch and Gearset:

*—Other ratios optional.
A—Amidships.
B & B—Borg & Beck Co., Chicago, Ill.
B-L—Brown-Lipe Gear Co., Syracuse, N. Y.
Cot—Cotta Trans. Corp., Rockford, Ill.
Cov—Covert Gear Co., Lockport, N. Y.
Det—A. J. Detlaff Co., Detroit, Mich.
D-G—Detroit Gear & Machine Co., Detroit, Mich.
Dod—Dodge Brothers Co., Detroit, Mich.
D—Disk.
Dur—Durston Gear Corp., Syracuse, N. Y.
Ful—Fuller & Sons Mfg. Co., Kalamazoo, Mich.
H-S—Hele-Shaw, Merchant & Evans Co., Philadelphia, Pa.
Hoo—Hoosier Clutch Co., Muncie, Ind.
J—Unit with Jackshaft.
K—Cone.
Lon—Long Mfg. Co., Detroit, Mich.
M-E—Merchant & Evans Co., Phila., Pa.
M. M.—Mechanics Mach. Co., Rockford, Ill.
Mun—Muncie Gear Works, Muncie, Ind.
O—Disk in Oil.
P—Plate.
R—Rear Axle.
Roc—Rockford Drilling Machine Co., Rockford, Ill.
S—Separate Unit.
U—Unit with Engine.
W-G—Warner Gear Co., Muncie, Ind.

Universal:

B.G.—Universal Machine Co., Bowling Green, Ohio.
Blo—Blood-Bros. Mach. Co., Allegan, Mich.
Det—Universal Products Co., Detroit, Mich.
Har—Spicer Mfg. Co., S. Plainfield, N. J.
M-E—Merchant & Evans Co., Phila., Pa.
M. M.—Mechanics Machine Co., Rockford, Ill.
Pet—Cleveland Universal Parts Co., Cleveland, Ohio.
Pic—Carl Pick Co., West Bend, Wis.
Sne—Spicer Mfg. Corp., S. Plainfield, N. J.
Spi—Spicer Mfg. Co., S. Plainfield, N. J.
The—Thermoid Rubber Co., Trenton, N. J.
Thei—Almetal Universal Joint Co., Cleveland, Ohio.
U-M—Universal Machine Co., Bowling Green, Ohio.
U-P—Universal Products Co., Detroit, Mich.

Front and Rear Axles:

½—Semi-Floating.
¾—Three-Quarter Floating.
B—Straight Bevel.
Cla—Clark Equip. Co., Buchanan, Mich.
Col—Columbia Axle Co., Cleveland, Ohio.
Con—Continental Axle Co., Edgerton, Wis.
C—Chain.
D—Dead.
Eat—Eaton Axle Co., Cleveland, Ohio.
F—Floating.
I—Internal Gear.
P—Spur Gear.
R—Double Reduction.
Rus—Russel Motor Axle Co., Detroit, Mich.
S—Spiral Bevel.
Sal—Salisbury Axle Co., Jamestown, N. Y.

She—Sheldon Axle & Spring Co., Wilkes-Barre, Pa.
Shu—Shuler Axle Co., Inc., Louisville, Ky.
Std—Standard Parts Co., Cleveland, Ohio.
Tim—Timken Det. Axle Co., Detroit, Mich.
Tor—Eaton Axle & Spring Co., Cleveland, Ohio.
Vul—Vulcan Motor Axle Co.
Wal—Walker Axle Co., Chicago, Ill.
W—Worm.
Wis—Wisconsin Parts Co., Oshkosh, Wis.

Brake:

A—Rear Wheels only.
B—Drive Shaft and Rear Wheels.
C—6 Wheel Brakes.
D—Jackshaft and Rear Wheels.
E—4 Wheel Brakes.

Springs:

Amc—American Autoparts Co., Detroit, Mich.
Arm—General Motors Co., Pontiac, Mich.
Bea—Eaton Spring Corp., Detroit, Mich. & Massillon, O.
Bet—Betts Bros. Sp. Co., Inc., San Francisco, Cal.
Cha—Champion Auto Sp. Co., St. Louis, Mo.
Del—D. Delany & Son, Newark, N. J.
Det—Detroit Steel Prod. Co., Detroit, Mich.
G-C—Garden City Sp. Works, Chicago, Ill.
Har—Harvey Sp. & Forging Co., Racine, Wis.
I. C.—Iron City Sp. Co., Pittsburgh, Pa.
Lah—Laher Auto Spring Co., Portland, Ore.
Mar—Maremont Mfg. Co., Chicago, Ill.
Mat—Mather Spring Co., Toledo, Ohio.
Mer—E. R. Merrill Spring Co., New York.
Pen—Penn Sp. Works, Baldwinville, N. Y.
Per—Eaton Bum. & Sp. Co., Cleveland, O.
Row—William & Harvey Rowland, Phila., Pa.
She—Sheldon Axle & Sp. Co., Wilkes-Barre, Pa.
S. P.—Spring Perch Co., Stratford, Conn.
S. S.—Standard Steel Sp. Co., Corapolis, Pa.
Tem—Temme Spring Corp., Chicago, Ill.
Tut—Tuthill Sp. Co., Chicago, Ill.
U. S.—United States Sp. Co., Los Angeles, Cal.

Steering Gear:

CAS—C. A. S. Products Co., Columbus, O.
D-G—Detroit Gear & Machine Co., Detroit, Mich.
Dod—Dodge Bros. Co., Detroit, Mich.
Gem—Gemmer Mfg. Co., Detroit, Mich.
Han—Hannum Mfg. Co., Milwaukee, Wis.
Jac—Saginaw Products Co., Saginaw, Mich.
Lav—Hannum Mfg. Co., Milwaukee, Wis.
Ros—Ross Gear & Tool Co., Lafayette, Ind.
Woh—Wohlrab Gear Co., Racine, Wis.

Wheels:

Arc—Archibald Wheel Co., Lawrence, Mass.
A-W—Auto Wheel Co., Lansing, Mich.
Bet—Bethlehem Steel Co., Bethlehem, Pa.
Bim—Bimel Spoke & Auto Wheel Co., Portland, Ind.
Bud—Budd Wheel Co., Phila., Pa.
Cla—Clark Equip. Co., Buchanan, Mich.
Day—The Dayton Steel Foundry Co., Dayton, Ohio.
Dis—Motor Wheel Corp., Lansing, Mich.
Hay—Hayes Wheel Co., Jackson, Mich.
Hoo—Hoopes, Bro. & Darlington, Inc., West Chester, Pa.
Ind—Indestructible Wheel Co., Lebanon, Ind.
Int—Interstate Foundry Co., Chicago, Ill.
Jon—Phineas Jones & Co., Hillside, N. J.
Kel—Kelsey Wheel Co., Detroit, Mich.
M-M—Michigan Malleable Iron Co., Detroit, Mich.
Mot—Motor Wheel Corp., Lansing, Mich.
Mun—Muncie Wheel Co., Muncie, Ind.
Nor—Northern Wheel Corp., Alma, Mich.
Pru—Prudden Wheel Co., Lansing, Mich.
Roy—Royer Wheel Co., Aurora, Ind.
Sch—St. Marys Wheel & Spoke Co., St. Marys, Ohio.
Smi—Smith Wheel, Inc., Syracuse, N. Y.
StM—St. Marys Wheel Co., St. Marys, O.
Std—Standard Wheel Co., Terre Haute, Ind.
Van—Van Wheel Corp., Onelda, N. Y.
Way—Wayne Wheel Co., Newark, N. Y.

Rim Equipment:

Cle—Cleveland Welding & Mfg. Co. of the Hydraulic Steel Co., Cleveland, Ohio.
Fir—Firestone Steel Prod. Co., Akron, O.
Gdy—Goodwear Tire & Rub. Co., Akron, O.
Hay—Hayes Wheel Co., Jackson, Mich.
Jax—Jaxon Steel Prod. Co., Jackson, Mich.
Kel—Kelsey Wheel Co., Detroit, Mich.
Non—None Supplied.

Electric Commercial Cars

Name and Model Number	Total Weight Resting on Four Tires	Chassis Weight—Exclusive of Battery	Minimum Load Capacity	Maximum Load Capacity	Chassis Price	Maximum Speed	Location of Battery	Mileage Per Charge	Motor	Controller	Speeds Forward	Drive	Rear Axle	Spring	Front Tires	Rear Tires	Steering Gear	Wheelbase	Per Cent of Weight on Rear Wheels
Autoear E 1F	10000	3650			2400		A		G-E	G-E	5	R	Own	Row	S 34x4	S 34x5	Ros	107	60
Autoear E 2D	15000	4300			2800		A		G-E	G-E	5	R	Own	Row	S 34x5	S 34x6	Ros	120	60
Autoear E 3H	18000	4900			3200		A		G-E	G-E	5	R	Own	Row	S 34x5	S 36x8	Ros	131	60
Autoear E 4Y	26000	6800			4000		A		G-E	G-E	5	R	Own	Row	S 34x6	DS36x6	Ros	138	60
Autoear E 5M	30000	7200			4300		A		G-E	G-E	5	R	Own	Row	S 36x7	DS36x7	Ros	138	60
C-T-H1	5600	2400				14	A	55	G-E	Own	4	Own	F	She	S 36x3½	S 36x4	W	108	67
C-T-F-1.5	6600	2800				14	A	60	G-E	Own	4	Own	F	She	S 36x3½	S 36x4	W	94	67
C-T-H-1.5	6600	2800				14	A	60	G-E	Own	4	Own	F	She	S 36x3½	S 36x4	W	116	67
C-T-F-2	8000	3100				14	A	50	G-E	Own	4	Own	F	She	S 36x3½	S 36x5	W	96	67
C-T-H-2	8000	3100				14	A	50	G-E	Own	4	Own	F	She	S 36x3½	S 36x5	W	124	67
C-T-F-4	11950	4200				12	A	50	G-E	Own	4	Own	F	She	S 36x4	DS36x4	W	116	67
C-T-A-7	17700	5800				11	A	45	G-E	Own	4	I	D	She	S 36x6	DS36x4	W	122	58
C-T-F-7	17500	6000				11	A	45	G-E	Own	4	Own	F	She	S 36x5	DS36x5	W	136	67
C-T-A-10	22250	6500				10	A	45	G-E	Own	4	I	D	She	S 36x7	DS36x5	W	132	58
C-T-F-10	22750	7000				10	A	45	G-E	Own	4	Own	F	She	S 36x6	DS36x6	W	152	67
C-T-F-14	28850	8000				8	A	45	G-E	Own	4	Own	F	She	S 36x7	DS36x7	W	152	67
Electruck 48	8700	3600	2000	3000	2000	15	A	50	G-E	G-E	4	C	Own	Eat	S 34x4	S 34x5	Ros	112	60
Electruck 39	10400	4200	4000	5000	2500	15	A	50	G-E	G-E	4	C	Own	Eat	S 34x4	S 34x6	Gem	122	60
Electruck 27	32000	12200	15000	20000	6000	12	A	50	G-E	Own	5	C	Own	Eat	S 36x7	S 40x14	Gem	163	70
Milburn 43	3790	1690	1000	1500	1585	17	H	50	G-E	Own	4	W	She	She	P 32x4½	P 32x4½	Ros	115	60
O. B-B						13			G-E	Own		C	D		S 36x4	DS36x3½	Own	107	
O. B-C						11			G-E	Own		C	D		S 36x5	DS36x4	Own	135	
O. B-D						10			G-E	Own		C	D		S 36x6	DS36x5	Own	143	
Steinmetz 15	6800	2200	1000	2250	1800	18	H&S	60	Own	Own	4	R	Own	Lig	P 32x4½	P 32x4½	Lav	114	55
Walker 12		1900				15	H&S	50	G-E	Own	4		Tim	Det	S 36x3½	S 36x3½	Ros	104	66
Walker 18		3000				14	A	50	Wes	Own	5	Own	Own	Mat	S 34x3	S 36x4	Ros	94	66
Walker 24		3200				13	A	50	Wes	Own	5	Own	Own	Mat	S 34x3½	S 36x5	Ros	101	66
Walker 42		4200				13	A	50	Wes	Own	5	Own	Own	Mat	S 36x4	S 36x6	Ros	114	66
Walker 60		6500				11	A	40	G-E	Own	5	Own	Own	Mat	S 36x5	DS40x5	Ros	131	66
Walker 70		7200				10	A	40	G-E	Own	5	Own	Own	Mat	S 36x6	DS40x6	Ros	141	66
Ward A211	4650	1800	600	1150		15	S	75	G-E	Own	4	W	She	She	S 32x3	S 32x3½	Own	88	56
Ward B-222	6000	2300	1020	1700		14	S	84	G-E	Own	4	W	She	She	S 32x3½	S 32x4	Own	91	62
Ward C-211	8000	2670	2170	2880		13	S	65	G-E	Own	4	W	She	She	S 32x3½	S 31x5	Own	96	64
Ward E-211	12000	3570	4290	5430		12½	S	56½	G-E	Own	4	W	She	She	S 34x4	S 36x6	Own	108	65
Ward G-211	16000	4500	6180	7760		11	S	44	G-E	Own	5	W	She	She	S 36x5	S 36x8	Own	120	68
Ward J-211	22500	6630	9500	11200		10	S	39½	G-E	Own	5	W	She	She	S 36x6	S 36x10	Own	136	70
Ward M-211	30000	8430	13790	15920		9	S	36	G-E	Own	5	W	She	She	S 36x7	DS36x7	Own	152	71

NOTE: Battery Equipment on all above makes is at the option of the purchaser. Battery Location Abbreviations: A-amidships; H-under hood; and S-under seat

After the Million Mark in 1926

(Continued from page 13)

what he asks for. He sees sellers as well as buyers.

Asked what was the best selling appeal to the truck prospect, particularly the owner with junk to trade, Hayden said, "the appeal to the thinking man. Our salesmen are instructed to set the prospect to thinking of the proposition as a business deal and a smart trade. Ultimate value is what counts with the real business man when buying a truck. Our salesmen, when calling on a prospect who first is interested in starting a competitive bidding race for some old truck, ignores the question and endeavors to interest the prospect on what transportation will eventually cost him. Our men offer a good product, sell it properly, it is backed by a concern with a chain of service stations, and by service that is prompt and reasonable. What more does a business man expect?"

"If the salesman runs into the type that has junk to sell, or is not the thinking type, then the truck dealer who is willing to pay high prices for junk gets the business. We do not want any business that will not show a reasonable profit."

There is no used truck problem with the Hayden concern. At the time the writer called there were but four used

vehicles among the three places. From January this year to about the middle of May, 50 used vehicles were moved, and at a fair profit. The trade-in truck is priced right when bought. It is then placed in first class mechanical condition, repainted and sold with a guarantee. Records are kept, of course, of the transaction, rather complete detail so that the history of each truck is obtainable if necessary.

The rebuilt and guaranteed trucks have proven good business builders. There is always a market for a truck in good condition and, if the customer is given a square deal, he is a live prospect for the repeat and without any great sales expense. The Hayden policies have built up the fleet business and in Bridgeport alone there are 18 fleets some of 12. Four of these fleet owners maintain their own service departments. Mechanics trained in the trucks sold by the Hayden company are employed, and Hayden stated every possible assistance was given these concerns. From a cost and service standpoint the service had worked out very satisfactorily.

Mention should be made of a Hayden rule that is strictly enforced. It is that knocking the other truck or the truck of the prospect is prohibited. I do not countenance any of my employees, particularly the salesmen, speaking ill of a competitor's truck.

My salesmen are out to sell our product, our company and our service. The other day one of our salesmen

made an unexpected sale which was the result of the courteous treatment of the competitor. The prospect asked what kind of a truck Mr. Blank handled. My salesman spoke well of the truck and the dealer. The prospect said: "H'um. I guess you get the order. The other salesman knocked H-ll out of yours."

Another Hayden rule is that no salesman can tell a user that his truck is ready for the junk pile, will cost a lot of money to fix up and the usual line to get an order for a new. It is the policy to give the old truck an honest inspection, an honest estimate and to advise the customer for his best interests.

It is the enforcement of such policies, and others, that have run a small business up to three quarters of a million gross in four years. The Hayden Automobile Company merchandises and services the Reo and Pierce-Arrow lines of trucks.

H. O. Smith Heads Automotive Division

Harold O. Smith, who for the past 30 years has been actively identified with the automotive industry, has been appointed chief of the Automotive Section of the United States Department of Commerce, taking the position formerly held by Percy Owen, who resigned to go with Dodge Brothers, Inc.,

C. C. J. SHOP IDEAS

THIS page is primarily designed to help service station repairmen in exacting economies in time, labor and money. Salesmen, however, can also profit by scanning over these practical hints. The average buyer of today is more conversant with the important details of truck operation and maintenance than ever before. A money-saving idea will often result in a sale.

Commercial Car Journal will pay as much as five dollars for each new idea which it accepts. Simply tell us exactly how it is done and send a rough pencil sketch showing clearly the method employed or the device used.

No. 94. Drilling Upward

Securing sufficient upward pressure is difficult when an electric drill is used beneath a chassis. The sketch shows a way to obtain the necessary force. A small groove, to receive the handle of the drill is made in the end of a timber. A block of wood under the timber acts as a fulcrum.—Charles Boehme, Brooklyn, N. Y.

No. 95. Removing Pinion Shaft Nut

A short handle open end wrench may be used to remove a rear axle pinion shaft nut, after differential has been removed. While the end of the wrench is against one of the bearing bosses the transmission is put in reverse and the engine turned over by the crank.

No. 96. Valve Rack

Collapsible ends feature the valve rack board illustrated. The ends are hinged to the main board and, when in use, held in place by brackets. Marked holes for valves are drilled in the board in the usual manner.—Frank Harazin, New York City.

No. 97. Attention-Attracting Grease Cups

Painting all grease cups bright red is an effective means of securing thorough lubrication of chassis parts. The bright color eliminated the possibility of any being overlooked, especially those in rather inaccessible places.—F. W. Sheets, Harrisburg, Pa.

No. 98. Steering Yoke for Engine Lifting

Steering tie-rod yoke ends can be used to make engine lifting attachments, as shown in our drawing. Each yoke is cut off and the hole bored out, if necessary. In use the yoke is put over a cylinder head stud and fastened with a stud nut. The chain ends are fastened to the original steering arm bolts through the yoke ends.—Fred Codd, Chicago, Ill.

No. 99. Mechanics' Tool Box

A passenger car running board tool box may easily be reconditioned to serve as a mechanics' tool box. A handle on the lid and a hasp and staple for locking are the essential changes.—R. G. Dasse, Burlington, N. J.

Hill Mill Equipment Catalog

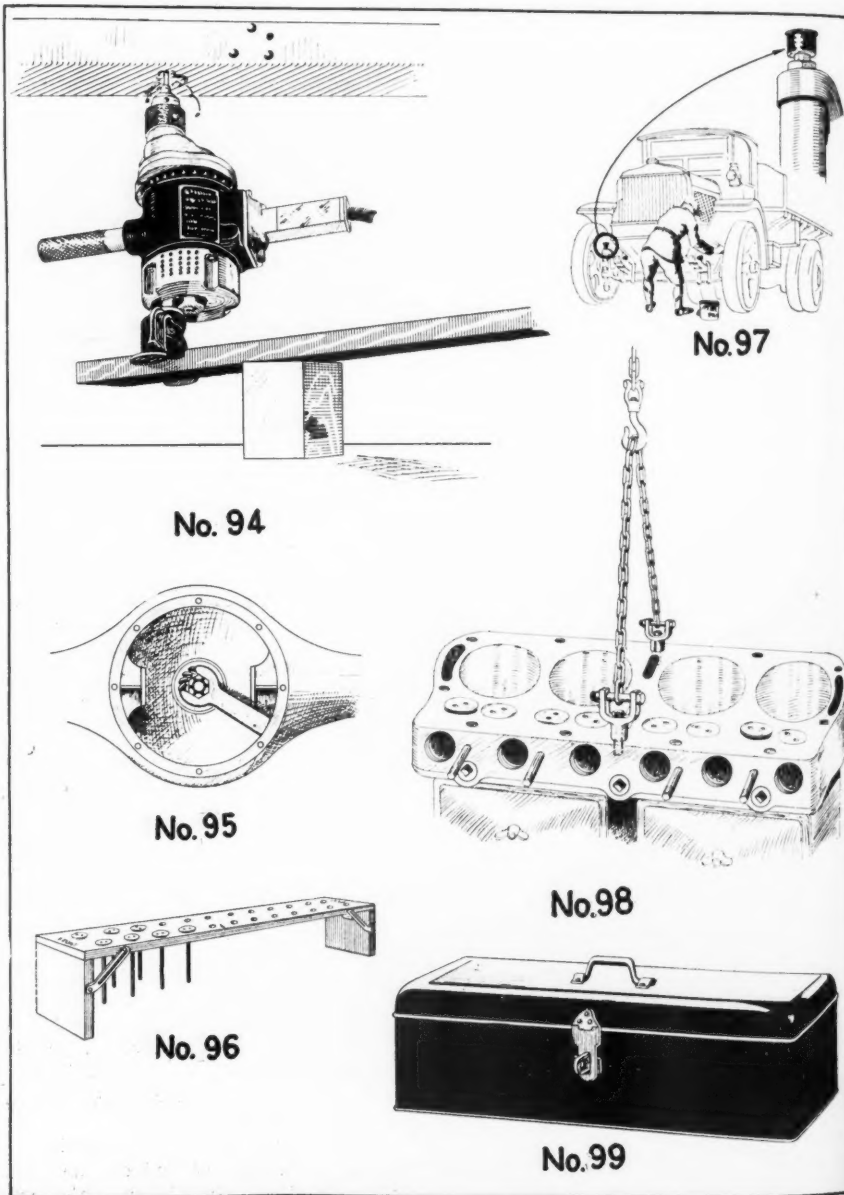
A new catalog listing shafting, bearings and power transmission machinery has been issued by Hill Clutch Machine & Foundry Co., Cleveland, Ohio. The catalog is in three sections. Section A describes flexible couplings and the "Cleveland type" oil film bearing. B covers clutch pulleys and cutoff couplings. C describes rope drives, gears, speed transformers, and tables of engineering data are also given.

Rust-Preventing Lacquer

A transparent hard drying lacquer for coating parts such as piston rings and drills to prevent rust while in storage has been placed on the market by Bradford Oil Co., Palmer, Mass. The new product, designated "Trans Lac Special" dries within one-half hour. Bradford products are sold under the trade name of Cedaroleum Anti-Rust compounds. In addition to Trans Lac Special the company makes other grades adapted for application to heavy machinery in storage, for export shipments, castings, fine tools and outdoor storage of machinery.

Trucks at Bottlers' Convention

Nine truck and body companies will exhibit during the Buffalo convention of the American Bottlers of Carbonated Beverages, Nov. 8 to 12. These include White Motor Co., Republic Motor Truck Co., Inc., International Harvester Co., General Motors Truck Co., Highland Body Mfg. Co., Graham Brothers, Federal Motor Truck Co. and Cleveland Pneumatic Tool Co.



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BETHLEHEM

News of the Trade

Exhibitors Lining Up Rapidly for National Shows

More than 100 manufacturers of parts, accessories and service equipment have already signified their intention of exhibiting at the National Automobile Shows at New York and Chicago next January and February. It is likely that the exhibitors outside the car and truck and taxicab sections will aggregate 200 or 300 manufacturers.

Shop equipment items already on the exhibit list include heavy machinery such as cranes, presses, hoists, towing apparatus, electric tools, electric charging and testing apparatus, air compressors and devices driven by air, jacks, welding and cutting equipment, cylinder boring and grinding machinery, wrenches and other speedy tools.

Plans are under way to tell the story of the shop equipment sections to wholesale and retail units throughout the service industry. The resulting trade attendance will benefit parts and accessory makers as well as the shop equipment manufacturers.

Space allotments to car, truck and taxicab manufacturers will be made at the N. A. C. C. members' meeting October 7, and assignments in the parts, accessory and shop equipment sections shortly after that date.

The coming National Automobile Shows will give a decided impetus to the enlightenment of the industry and the public on the advantages of modern service equipment, in the opinion of S. D. Black, president of the Black & Decker Manufacturing Co., and a director of the Motor and Accessory Manufacturers Association. Mr. Black believes that the shop equipment sections in the shows at New York and Chicago next January and February will emphasize in a spectacular way the opportunities for dealers to put their profits on a more substantial basis through the use of machinery and tools designed to make repair and adjustment work speedy and accurate.

Road Show Attracts Wide Interest

Applications for exhibition space at the Road Show and other indications point to even wider interest than during previous years in the annual convention of the American Road Builders' Association, to be held in Chicago during Good Roads Week, Jan. 10 to 14 next, according to officials of the association's national headquarters in Washington.

Headquarters will be opened Dec. 10, by the association, at the New Palmer House, to take care of the pre-convention arrangements.

H. G. Shirley, president of the association and chairman of the Virginia

Highway Commission, has arranged several new features for the program. These include a "Pan-American Day," at which delegates from North, Central and South American countries will hold the center of the stage with their exhibits and in various addresses. This day will be observed Jan. 12. Jan. 11 will be "Governor's Day" at which state executives from various parts of the country, particularly those identified with the good roads movement, will be special guests.

Provisions have been made to accommodate 2000 at the annual banquet of the convention.

North East Service Inc. held its Sixth Annual Sales and Service Convention recently, at the home office in Rochester, N. Y. Plans were laid for wider and more intensive distribution of the Northeastern horns and for further expansion of the service organization.

Truck Equipment Association Elects New Officers

The Annual Meeting of "Equipment for Motor Truck, Inc.," was held in Buffalo, recently. It was the unanimous opinion of those present that the organization was a much needed one in the industry and that it would be in a short time a big factor in the bringing about standardization of Motor Truck Equipment. Already in the short space of one year the organization has caused a better feeling and understanding between the distributor and manufacturer of Motor Truck Equipment. Both manufacturer and distributor of equipment are eligible to membership in this organization.

The directors and officers for this new year are as follows:

Directors: Wm. Morrison, Chairman, Highland Body Co., Cincinnati, Ohio; Jacob Press, Jacob Press' Sons, Chicago, Ill.; C. F. Tiers, The Schnable Co., Pittsburgh, Penna.; W. R. Couch, Interboro Hoist & Body Corp., Long Island City, New York.

Officers: President, W. R. Couch, Interboro Hoist & Body Corp., Long Island City, New York; 1st vice-President, P. E. O'Connor, Columbian Steel Tank Co., Kansas City, Mo.; 2nd Vice-President, C. F. Tiers, The Schnable Co., Pittsburgh, Pa.; Treasurer, E. R. Boeck, Truck Equipment Co., Inc., Buffalo, N. Y.; Secretary, Geo. M. Bunn, General Woodwork Corp., Cincinnati, Ohio.

Wm. G. Mayer of the Mayer Body Corp., 6461 Frankstown Ave., Pittsburgh, Penna., has been appointed Chairman of the Membership Committee by the President for the year 1926-1927.

\$1,000,000 Bus Consolidation

The Reo Bus Line Co., the Red Star Transportation Co., Lexington, Ky.; the White Star Bus Lines of Winchester, and the Safety Motor Carriers of Louisville, recently consolidated into a \$1,000,000 corporation. General offices will be located in Lexington with an eastern terminal at Ashland, Ky., a western terminal at Louisville and branch offices in all the terminal cities and principal towns touched by the system. The lines cover 1000 miles of territory and will be extended as required.

A recent addition to the operations of the Federal Motor Truck Co., Detroit, manufacturers of Federal trucks, is the body building plant which is now turning out fifty bodies and cabs a day. A large stamping division, recently started, is making parts for cabs and bodies.

Coming Events

SHOWS

Boston, Mass.	March 5-12
Mechanics' Bldg.	
Chicago	Nov. 8-13
Coliseum, Automotive Equipment Association.	
Chicago	Nov. 15-19
Hotel Sherman, National Standard Parts Association.	
Chicago	Jan. 10-15
Coliseum, American Road Builders' Association.	
Cleveland	Jan. 22-29
Public Auditorium.	
Dallas, Texas	Oct. 9-24
Auditorium Bldg.	
Kansas City, Mo.	Feb. 12-19
Montreal, Can.	Jan. 22-29
National Motor Show of Eastern Canada, Morgan Bldg.	
New York	Oct. 20-30
Electrical and Industrial Exposition, Grand Central Palace.	
New York	Jan. 8-15
National Grand Central Palace, National Automobile Chamber of Commerce.	
Seranton, Pa.	Jan. 19-22
Armory.	
Springfield, Ill.	Oct. 28-29
Second Annual Bus Show, State Armory, Illinois Motor Transportation Association.	
Wichita, Kans.	Feb. 22-25
Southwest Road Show, Wichita Thresher and Tractor Club, Inc.	

CONVENTIONS

American Road Builders' Association, Congress Hotel, Chicago	Jan. 10-15
Automotive Equipment Association, Coliseum, Chicago	Nov. 8-13
National Standard Parts Association, Hotel Sherman, Chicago	Nov. 15-19
National Tire Dealers' Association, Inc., Memphis, Tenn.	Nov. 16-18
Society of Automotive Engineers, National Transportation and Service Meeting, Boston, Mass.	Nov. 16-18

COMING FEATURE ISSUES OF CHILTON CLASS JOURNAL PUBLICATIONS

Nov. 4—Motor World Wholesale—Annual Marketing Issue.	
Dec. 10—Operation and Maintenance—Service Station Equipment Issue.	
Dec. 15—Commercial Car Journal—Good Roads Issue.	
Jan. 1—Automobile Trade Journal—Annual Show Issue.	
Jan. 6—Motor Age—Annual Show Issue.	
Jan. 15—Commercial Car Journal—New York Show Issue.	



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